

INSTALLATION RESTORATION PROGRAM

(2)

RICKENBACKER AIR NATIONAL GUARD BASE
COLUMBUS, OHIO

**ADDITIONAL SITE INSPECTION SAMPLING
ADDENDUM #1 TO SI/RI/FS/RD WORK PLAN**

AD-A252 558



FINAL

OCTOBER 1989

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ADDITIONAL SITE INSPECTION SAMPLING

**ADDENDUM #1 TO SI/RI/FS/RD WORK PLAN FOR
RICKENBACKER AIR NATIONAL GUARD BASE
COLUMBUS, OHIO
FINAL**

OCTOBER, 1989



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HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM

Operated by:

**MARTIN MARIETTA ENERGY SYSTEMS, INC.
Oak Ridge, Tennessee**

For the

**U. S. DEPARTMENT OF ENERGY
Under Contract No. DE-AC05-84OR21400**

Submitted to:

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Andrews AFB, Maryland**

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SECTION 1.0

INTRODUCTION

1.1 Background and Purpose

This Work Plan Addendum was prepared by Engineering-Science (ES) for the Hazardous Waste Remedial Actions Program (HAZWRAP) and the National Guard Bureau (NGB) for implementation of additional Site Inspection (SI) sampling at Rickenbacker Air National Guard Base (RANGB), Ohio. This additional work is made possible through an interagency agreement between the U.S. Department of Energy and the U.S. Air Force which facilitates the use of the Installation Restoration Program (IRP) by the NGB. This document serves as an addendum to the Final RANGB Site Inspection/Remedial Investigation/Feasibility Study/Remedial Design Work Plan dated June 1988.

The purpose of this addendum work plan is to define the additional Site Inspection (SI) work to be conducted at the RANGB sites. The additional work is necessary in order to accomplish the objectives of the SI at each site, which are the following: 1. Determine if the soil is contaminated, 2. Determine the depth of soil contamination, and 3. Determine if the groundwater is contaminated. This addendum work plan will also be used to define some modifications to the initial SI work plan based on guidelines established by HAZWRAP and comments from the U.S. Environmental Protection Agency (U.S. EPA) and Ohio EPA. Data generated by the additional SI sampling will be added to the previous SI database for reporting purposes.

1.2 Work Plan Modifications

This section serves to outline the various sections of the SI work plan (SIWP) that will either remain the same or require modifications. The majority of the SIWP will not change and will be utilized as the guidance document for field investigations.

Section 1 of the SIWP is an introduction of the IRP, the Base, and the various sites under investigation. Section 1 remains unchanged. Section 2 of the SIWP presents the tasks to be performed in the SI/RI/FS/RD for the 23 sites at RANGB. Section 2 remains unchanged. Section 3 of the SIWP presents the types of

investigation to be conducted at the 23 sites at the RANGB. Section 3 is not modified, but additional investigation will be added to most sites (See Section 3 of this document). Site 26 is not mentioned in Section 3.0 because no additional work will be conducted at the site. The initial SI work program at Site 26 (surface soil sampling and analysis) did not detect any contamination and therefore the site will be removed from future SI activities. Section 4 of the SIWP describes the Remedial Investigation portion of the SI/RI/FS/RD and is not changed.

Modifications to Sections 5 (Field Investigation Techniques), 6 (Sampling and Analytical Plan) and 7 (Laboratory Analytical Quality Assurance/Quality Control [QA/QC] Plan) are defined in Section 2 of this addendum.

SECTION 2.0

SPECIFIC WORK PLAN MODIFICATIONS

Modifications to the SI work plan are necessary due to comments and guidelines established after the SI work plan was compiled. The comments are from the U.S. EPA and Ohio EPA who reviewed the SI work plan and submitted several suggestions. The guidelines consist of two HAZWRAP documents: Requirements for Quality Control of Analytical Data (August 1988) and Quality Control Requirements for Field Methods (February, 1989).

2.1 Modifications to Field Investigation Techniques

There are only three modifications to the Field Investigation Techniques discussed in Section 5 of the SIWP.

The first change deals with the handling of the soil cuttings from the drilling operations. In the SIWP the stated procedure is to store all soil cuttings in drums on-site pending receipt of chemical analytical results on representative samples. The new procedure will be to store the cuttings in drums only if the field photoionization detector (PID) values for the soil headspace exceed 100 parts per million (ppm). If the PID values are less than 100 ppm, the cuttings will be placed on, and covered with, plastic sheeting. After receipt of the soil analytical results, the cuttings will be spread at the drilling sites if non-hazardous, or disposed of at the proper landfill if hazardous.

The second modification involves increasing the documentation for monitoring well construction. The HAZWRAP monitoring well construction log shown as Figure 2.1 will now be used in all reports.

2.2 Modifications to Sampling and Analytical Plan

There are three modifications to the Sampling and Analytical Plan presented in Section 6 of the SIWP.

In regards to the methodology of sampling soil for volatile organics analysis, the following procedure will be followed. Prior to driving, each split-spoon will be

FIGURE 2.1

MONITORING WELL CONSTRUCTION LOG - Double Cased			REV. DATE: JAN 1989
WELL NO.:	Installation:	Site:	
Project No.:	Client/Project:		
HAZWRAP Contractor:	Drlg Contractor:		
Comp. Start: (: _ m)	Comp. End: (: _ m)		
Built By:	Well Coord: _____		
Elev. _____ Height _____	PROTECTIVE CSG Material/Type _____		
Elev. _____ Height _____	Diameter _____		
GS Elev. _____ GS Height 0.00' Depth BGS _____	Depth BGS _____ Weep Hole (Y/N) _____		
GUARD POSTS (Y/N) No. _____ Type _____			
SURFACE PAD Composition & Size _____			
SURFACE CSG Type _____ Diameter _____ Total Length _____			
GROUT: Setup/Hydration Time _____ Composition & Proportions _____			
Interval BGS _____ Tremied (Y/N) _____			
RISER PIPE Type _____ Diameter _____ Total Length (TOC to TOS) _____			
GROUT Composition & Proportions _____			
Interval BGS _____ Tremied (Y/N) _____			
CENTRALIZERS (Y/N) Depth(s) _____			
SEAL Type _____ Source _____ Setup/Hydration Time _____ Vol. Fluid Added _____ Tremied (Y/N) _____			
FILTER PACK Type _____ Amount Used _____ Source _____ Gr. Size Dist. _____ Tremied (Y/N) _____			
SCREEN Type _____ Diameter _____ Slot Size & Type _____			
SUMP (Y/N) Interval BGS _____ Length _____ Bottom Cap (Y/N) _____			
BACKFILL PLUG Material _____ Setup/Hydration Time _____ Tremied (Y/N) _____			
TD: _____			
Borehole dia. _____			

assembled with several 6-inch brass liners, the number of liners used being dictated by the length of the split-spoon. After driving, the split-spoon will be disassembled and the second liner from the bottom (stratigraphically) will be sealed with Teflon caps, wrapped in aluminum foil and securely taped. This sample will then be ready for transport to the laboratory. The remaining liners will then be extruded and the material used for lithologic description and other analyses. The emptied liners will be decontaminated and reused in subsequent split-spoons.

The second modification to the SAP involves groundwater samples collected for metals analysis. These samples will be filtered in the field with a 0.45 micron mesh filter. The purpose of the filtering is to remove the suspended particles from the groundwater, so that the subsequent laboratory analysis will measure only the dissolved metal concentrations. Both an unfiltered and filtered groundwater sample will be analyzed from all wells where metals analysis is conducted.

The third change pertains to where the SIWP incorrectly listed the holding time prior to extraction for environmental samples tested for semi-volatile organic compounds (SVOC). The correct holding time for SVOC samples prior to extraction is seven (7) days.

2.3 Modifications to Laboratory QA/QC Plan

The modifications to the Laboratory QA/QC Plan are based exclusively on the U.S. EPA comments on the SIWP. The following subsections address the EPA comments on the SI QA/QC Plan.

COMPLETENESS

The completeness objective for this project is 90 percent. This is the amount of valid data obtained versus the amount of data expected.

REPRESENTATIVENESS

Representativeness expresses the degree to which sample data represents the characteristics of a population. The following QA/QC samples will be analyzed to insure a high level of representativeness.

Trip Blank - Trip blanks consist of deionized organic-free water in 40 ml vials filled by the laboratory for purposes of traveling with a cooler of samples back to the lab. The purpose of the trip blank is to determine if any volatile organics have been absorbed by the samples during shipment. The trip blanks are only tested for volatile organic compounds.

Field and Rinseate Blanks - A field blank is a sample of the deionized organic-free water or tap water that is used during the decontamination of the sampling equipment. It is placed directly from the source bottle into an appropriate sample container. The field blanks document whether the decontamination water is contaminant-free. Rinseate blanks consist of deionized organic-free water poured through the decontaminated bailer or split-spoon sampler into sample bottles. The rinseate blanks document whether the sampling equipment has been successfully decontaminated. Field and rinseate blanks are analyzed for the same parameters as the corresponding samples. Field blanks are collected for each sampling event and/or from each source of decontamination water. One rinseate blank is collected for each day of sampling, however, analysis will only be performed on half of the samples (alternate days).

Method Blanks - Method blanks are aliquots of analyte-free water analyzed with a sample batch to identify contaminants introduced by the preparation or analysis procedure. One method blank is analyzed for every 20 samples.

One field duplicate will be collected for every 10 samples. It will be given a coded identifier and analyzed for the same parameters as the sample.

COMPARABILITY

Where appropriate, the results of analyses obtained will be compared with the results obtained in previous studies.

Consistency in the acquisition, handling, and analysis of samples by EPA-recommended procedures is necessary in order that the results may be compared. To this end, standard solutions and materials used in calibrating field and laboratory analytical instruments must be traceable to National Bureau of Standards (NBS) or EPA standards, and published analytical methods will be followed scrupulously.

ACCURACY

The degree of accuracy, on percentage recovery for inorganics and metals should fall in the range of 80 to 120 percent.

PRECISION

The precision obtained for metals analyses shall be evaluated based upon a control limit of 20 relative percent difference (RPD) for values greater than five times the detection limit. For values less than five times the detection limit, a control limit of two times the detection limit is used for soils and a control limit of one times the detection limit is used for water samples.

REAGENT BLANKS

An analyte concentration in a reagent blank of two times the reporting limit associated with the method will be used as an advisory limit.

DATA VALIDATION

Data validation for the analyses to be performed on soil and groundwater samples collected during this additional SI work will be made in compliance with HAZWRAP Level C or CLP protocols. SW-846 and EPA methodologies will be validated to HAZWRAP Level C. CLP analyses will be validated to CLP protocols.

SECTION 3.0

SITE INSPECTION ADDENDUM WORK SCOPE

This section describes the additional SI work to be conducted at the sites at Rickenbacker ANGB. Table 3.1 provides a summary of the sampling program, and is followed by more detailed accounts of the work scope at each site.

Site 26 is not mentioned in Section 3.0 because no additional work will be conducted at the site. The initial SI work program at Site 26 (surface soil sampling and analysis) did not detect any contamination and therefore the site will be removed from future SI activities.

The analyses performed at each site at RANGB during the additional SI work is based upon the findings of the SI Report dated February 1989 and meetings with representatives of the National Guard Bureau and HAZWRAP. For example, volatile organic analyses at known fuel spill sites will consist of the aromatic volatile organics (Method 8020) instead of the extensive volatile scan (CLP). In general, the analyses for each site cover the same target parameters as the previous work, except where modified by prior laboratory results.

TABLE 3.1
SUMMARY OF ADDITIONAL SITE INSPECTION SAMPLING PROGRAM
RICKENBACKER ANGB, OHIO

Site	Field Activity	# Field Samples	Matrix	Analyses
#2	JP-4 Tank Farm: - Two borings to 15' or water table - Four 2" wells to upper aquifer - Twenty soil-gas survey points - Groundwater sampling of new and existing wells - Slug tests in four wells	4 8 -- 7 --	Soil Soil -- Water	DEI DEI -- DEI --
#3	JP-4 Pumping Station 4: - Four borings to water table or 15' - Groundwater sampling of existing wells	8 2	Soil Water	CEI CEI
#4	JP-4 Pumping Station 5: - Two boring to water table or 15' - Groundwater sampling of existing wells	4 2	Soil Water	CEI CEI
#5	Lateral Safety Zone Spill Area: - One boring to water table or 15' - Groundwater sampling of existing wells	2 2	Soil Water	DE DE
#6	Underground Storage Tanks at the Base Filling Station: - One 2" well to upper aquifer - Groundwater sampling of new and existing wells - Slug test one well	2 2 --	Soil Water --	DEI DEI --
#9	Salvage Yard: - Groundwater sampling of existing well	1	Water	F

***EXPLANATION**

B = Organochlorine Pesticides and Chlorinated Phenoxy Herbicides (Method 8080/3510 and 8150)

C = Volatile Organics (CLP)

D = Aromatic Volatile Organics (Method 8020)

E = Petroleum Hydrocarbons (Method 418.1), soil extraction by (SW846, Method 9071).

F = Priority Pollutants Metals (Total and Dissolved on each water sample)

H = Sulfates (Method 9038), Alkalinity (EPA 310.1), and Acidity (EPA 305.1)

I = Lead (Method 7421)

K = Semi-Volatile Organics (Base/Neutral Extractables) (CLP)

NOTE: Data Quality Objective for all analyses will be in accordance with HAZWRAP Level C or with CLP protocol where indicated.

TABLE 3.1 - (continued)
SUMMARY OF ADDITIONAL SITE INSPECTION SAMPLING PROGRAM
RICKENBACKER ANGB, OHIO

Site	Field Activity	# Field Samples	Matrix	Analyses
#10 JP-4 Fuel Line Rupture:	- One boring to 15' or water table - One 2" well to upper aquifer - Groundwater sampling of new and existing wells - Slug test one well	2 2 2 --	Soil Soil Water	CEF CEF CEF --
#12 JP-4 Old Drum Storage Area:	- One 2" well to upper aquifer - Groundwater sampling of new and existing wells - Slug test one well	2 2 --	Soil Water	CE CE --
#14 KC 135 Crash Site:	- Groundwater sampling of existing wells	2	Water	DE
#15 Southwest Fuel Dump Pit:	- Two borings to 15' or the water table - Groundwater sampling of existing wells	4 2	Soil Water	DEI DEI
#16 Northeast Fuel Dump Pit:	- Two borings to 15' or water table - Groundwater sampling of existing wells	4 2	Soil Water	DEI DEI
#17 Old Entomology Lab:	- Groundwater sampling of existing well	1	Water	B
#19 North Coal Pile:	- Groundwater sampling of existing wells	2	Water	CEFHK

*** EXPLANATION**

B = Organochlorine Pesticides and Chlorinated Phenoxy Herbicides (Method 8080/3510 and 8150)

C = Volatile Organics (CLP)

D = Aromatic Volatile Organics (Method 8020)

E = Petroleum Hydrocarbons (Method 418.1), soil extraction by (SW846, Method 9071).

F = Priority Pollutants Metals (Total and Dissolved on each water sample)

H = Sulfates (Method 9038), Alkalinity (EPA 310.1), and Acidity (EPA 305.1)

I = Lead (Method 7421)

K = Semi-Volatile Organics (Base/Neutral Extractables) (CLP)

NOTE: Data Quality Objective for all analyses will be in accordance with HAZWRAP Level C or with CLP protocol where indicated.

TABLE 3.1 - (continued)
SUMMARY OF ADDITIONAL SITE INSPECTION SAMPLING PROGRAM
RICKENBACKER ANGB, OHIO

Site	Field Activity	# Field Samples	Matrix	Analyses
#20 South Coal Pile:	- One 2" well to upper aquifer - Groundwater sampling of new and existing wells - Slug test one well	2 3 --	Soil Water	CEFHK CEFHK --
#21 Leaking Drum and Oil Change Area at Plant:	- One boring to 15' or water table - One 2" well to upper aquifer - Groundwater sampling of new well - Slug test one well	2 2 1 --	Soil Soil Water	DEF DEF DEF --
#22 Heat Plant Lube Oil Drum Storage Area:	- One boring to 15' or water table - One 2" well to upper aquifer - Groundwater sampling of new well - Slug test one well	2 2 1 --	Soil Soil Water	CE CE CE --
#23 Fire Training Area:	- One 2" well to upper aquifer - Groundwater sampling of new and existing wells - Slug test one well	2 5 --	Soil Water	CKF CKF --

***EXPLANATION**

B = Organochlorine Pesticides and Chlorinated Phenoxy Herbicides (Method 8080/3510 and 8150)

C = Volatile Organics (CLP)

D = Aromatic Volatile Organics (Method 8020)

E = Petroleum Hydrocarbons (Method 418.1), soil extraction by (SW846, Method 9071).

F = Priority Pollutants Metals (Total and Dissolved on each water sample)

H = Sulfates (Method 9038), Alkalinity (EPA 310.1), and Acidity (EPA 305.1)

I = Lead (Method 7421)

K = Semi-Volatile Organics (Base/Neutral Extractables) (CLP)

NOTE: Data Quality Objective for all analyses will be in accordance with HAZWRAP Level C or with CLP protocol where indicated.

TABLE 3.1 - (continued)
SUMMARY OF ADDITIONAL SITE INSPECTION SAMPLING PROGRAM
RICKENBACKER ANGB, OHIO

Site	Field Activity	# Field Samples	Matrix	Analyses
#24	Sewage Treatment Plant Sludge Beds: - One 2" well to upper aquifer - Groundwater sampling of new and existing wells - Slug test one well	2 4 --	Soil Water	F F --
#25	Storm Drainage Ditch System: - Groundwater sampling of existing wells	4	Water	F
#27	Drainage Ditch Near Landfill: - Groundwater sampling of existing wells	1	Water	F
	Background Soil Samples: - Four borings to 15' or the water table	8	Soil	F

***EXPLANATION**

B = Organochlorine Pesticides and Chlorinated Phenoxy Herbicides (Method 8080/3510 and 8150)

C = Volatile Organics (CLP)

D = Aromatic Volatile Organics (Method 8020)

E = Petroleum Hydrocarbons (Method 418.1), soil extraction by (SW846, Method 9071).

F = Priority Pollutants Metals (Total and Dissolved on each water sample)

H = Sulfates (Method 9038), Alkalinity (EPA 310.1), and Acidity (EPA 305.1)

I = Lead (Method 7421)

K = Semi-Volatile Organics (Base/Neutral Extractables) (CLP)

NOTE: Data Quality Objective for all analyses will be in accordance with HAZWRAP Level C or with CLP protocol where indicated.

3.1 SITE 2: JP-4 Tank Farm

Previous work on site 2 included a nineteen-point soil gas survey and the installation of three groundwater monitoring wells. The purpose of the additional sampling at Site 2 is primarily to investigate the eastern half of the tank farm for soil and groundwater contamination. This portion of Site 2 (including tanks 4, 5 and 6) was operated by the Rickenbacker Port Authority (RPA) but is still owned by the RANGB. During this investigation, a twenty-point soil gas survey will be conducted, four monitoring wells will be installed, and two soil borings will be drilled. Soil and water samples will be taken at each boring/monitoring wells respectively. Laboratory analysis for aromatic volatile organics (SW-846 Method 8020), lead (Method 7421), and petroleum hydrocarbon (EPA Method 418.1) content will be performed on all environmental samples collected.

A twenty-point soil gas survey will be performed on the northern and eastern boundaries of the bulk storage area (see Figure 3.1). This area was chosen due to the occurrence of a product release identified along the RPA product line northwest of the tank farm in July 1988. Upon further investigation, the source of the product spill was found to be a poorly sealed catch basin in the RPA fuel loading area. The soil-gas survey will aid in determining the extent of hydrocarbons in the backfill material surrounding the pipeline.

Two soil borings will be placed on the site. These borings will be completed to a depth of fifteen feet or to the initial occurrence of the water table. Soil samples will be taken at five foot intervals. The two soil samples from each boring having the highest headspace photoionization detector (PID) values will be sent to the laboratory for analysis.

A total of four monitoring wells will be installed on the site. These wells will be drilled to a depth of approximately thirty feet and set with the base of the 10 foot well screen approximately 5 to 7 feet below the water table. Using the same criteria as the borings, two soil samples will be taken from each well for further laboratory analysis. Groundwater samples from the four new wells and the three existing monitoring wells will be taken for laboratory analysis.

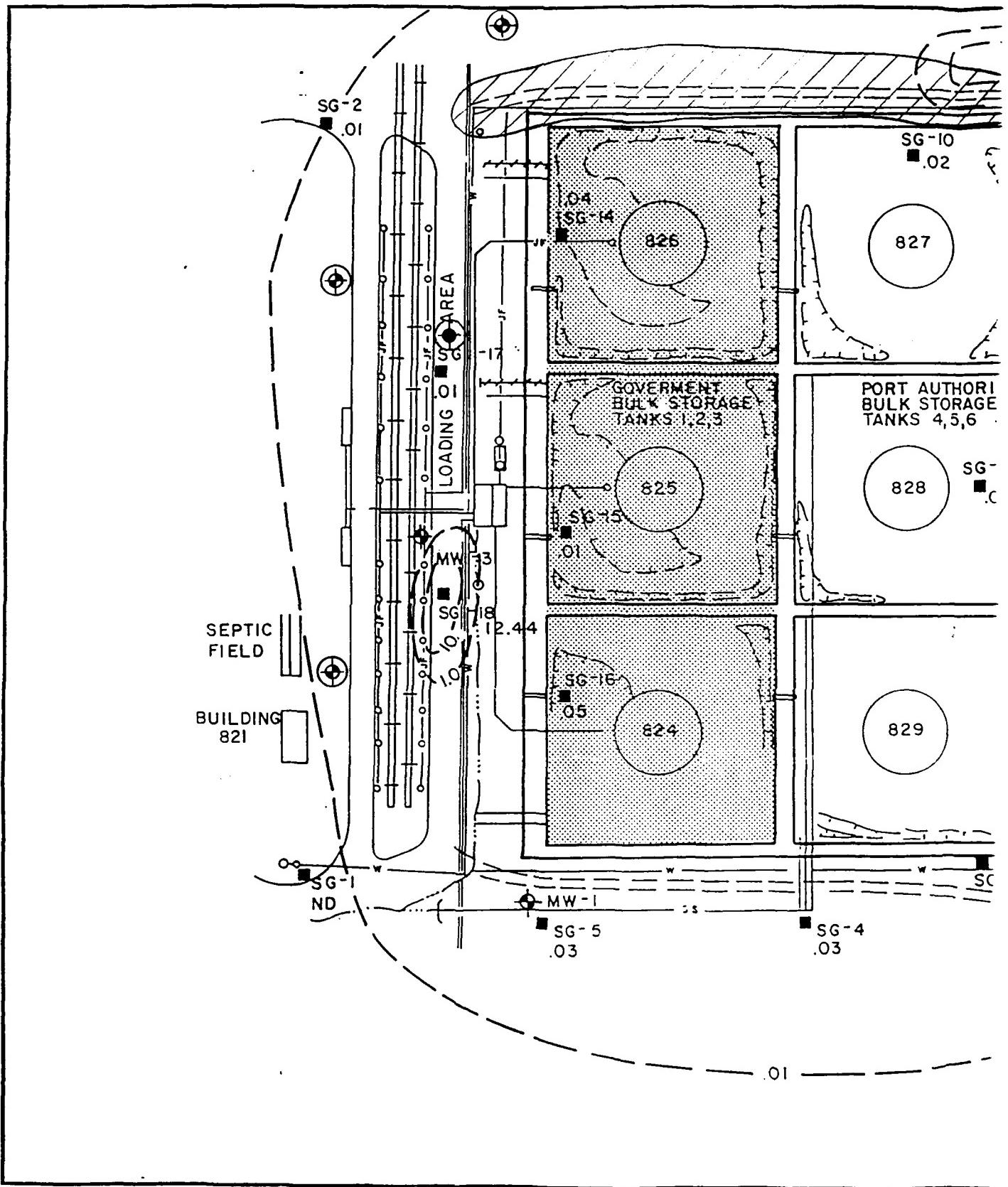


FIGURE 3.1



1" = 100'

LEGEND:

- [Hatched square] ANG TANK AREA
- [Solid black square] SOIL GAS POINT
- [Circle with crosshair] MONITORING WELL
- [Line with arrowhead] PUMP DISCHARGE LINE
- [Line with arrowhead] CONTAINMENT TRENCH
- [Line with arrowhead] I.O.—TOTAL BTX SOIL GAS ISOCON (ppm), LOGARITHMIC INTERVAL
- [Diagonal hatching] PROPOSED SOIL-GAS SURVEY AREA
- [Circle with dot] PROPOSED SOIL BORING
- [Circle with crosshair] PROPOSED MONITORING WELL

ADDITIONAL WORK

- 20 SOIL-GAS SURVEY POINTS
- 4 TWO-INCH MONITORING WELLS
- 2 SOIL BORINGS
- SOIL & GROUNDWATER ANALYSES
- SLUG TESTS

SOIL GAS CONCENTRATION MAP
SITE 2 (RB 2)
BULK STORAGE TANK FARM
RICKENBACKER
AIR NATIONAL GUARD BASE

Each new groundwater monitoring well will have a slug test performed on it to determine hydrogeologic characteristics of the aquifer in the vicinity of the well.

3.2 SITE 3: JP-4 Pump Station No. 4

Previous activities for Site 3 included a ten-point soil gas survey and the installation of two groundwater monitoring wells. The purpose of the additional sampling at Site 3 is to determine whether the water pumped and discharged from the underground storage tank (UST) pit onto the surface is contaminating the soil or groundwater. The drainage path leading from the discharge point typically has dead vegetation and a hydrocarbon sheen. During this investigation, four soil borings will be drilled at the site, and groundwater samples will be collected from the existing monitoring wells. Laboratory analysis for volatile organics (CLP) petroleum hydrocarbon (EPA Method 418.1) content and lead (total and dissolved for water samples) will be performed on all soil and water samples collected.

A total of four soil borings will be drilled in the fuel ponding area of Site 3 (see Figure 3.2). All borings will be drilled to a depth of fifteen feet or initial occurrence of the water table. Soil samples will be collected at five foot intervals. The two samples from each boring with the highest headspace PID value will be sent to the laboratory for analysis. Three of the four borings will be placed upgradient and north to northwesterly of the two existing monitoring wells in the fuel ponding area. A fourth boring will be located downgradient of the two existing wells and at the far northeasterly boundary of the fuel ponding area.

Groundwater samples from the existing monitoring wells will be collected and analyzed.

3.3 SITE 4: JP-4 Pump Station No. 5

Previous site activities included a five-point soil gas survey and the installation of two groundwater monitoring wells. The purpose of the additional sampling at Site 4 is to determine whether the water pumped and discharged from the UST pit onto the surface is contaminating the soil or groundwater. The drainage path leading from the discharge point typically has dead vegetation and a hydrocarbon sheen. During this investigation, two soil borings will be drilled with soil samples collected

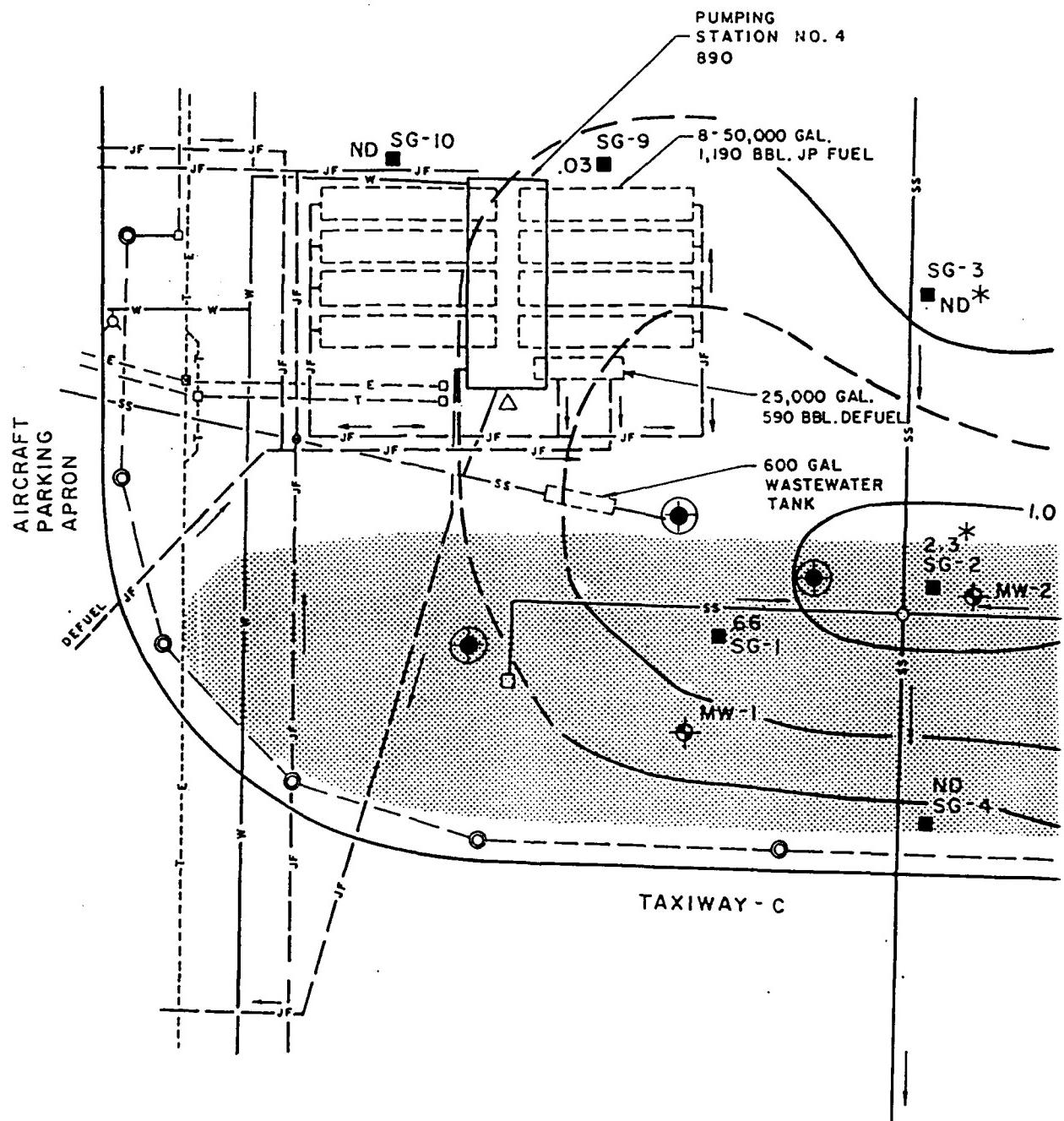
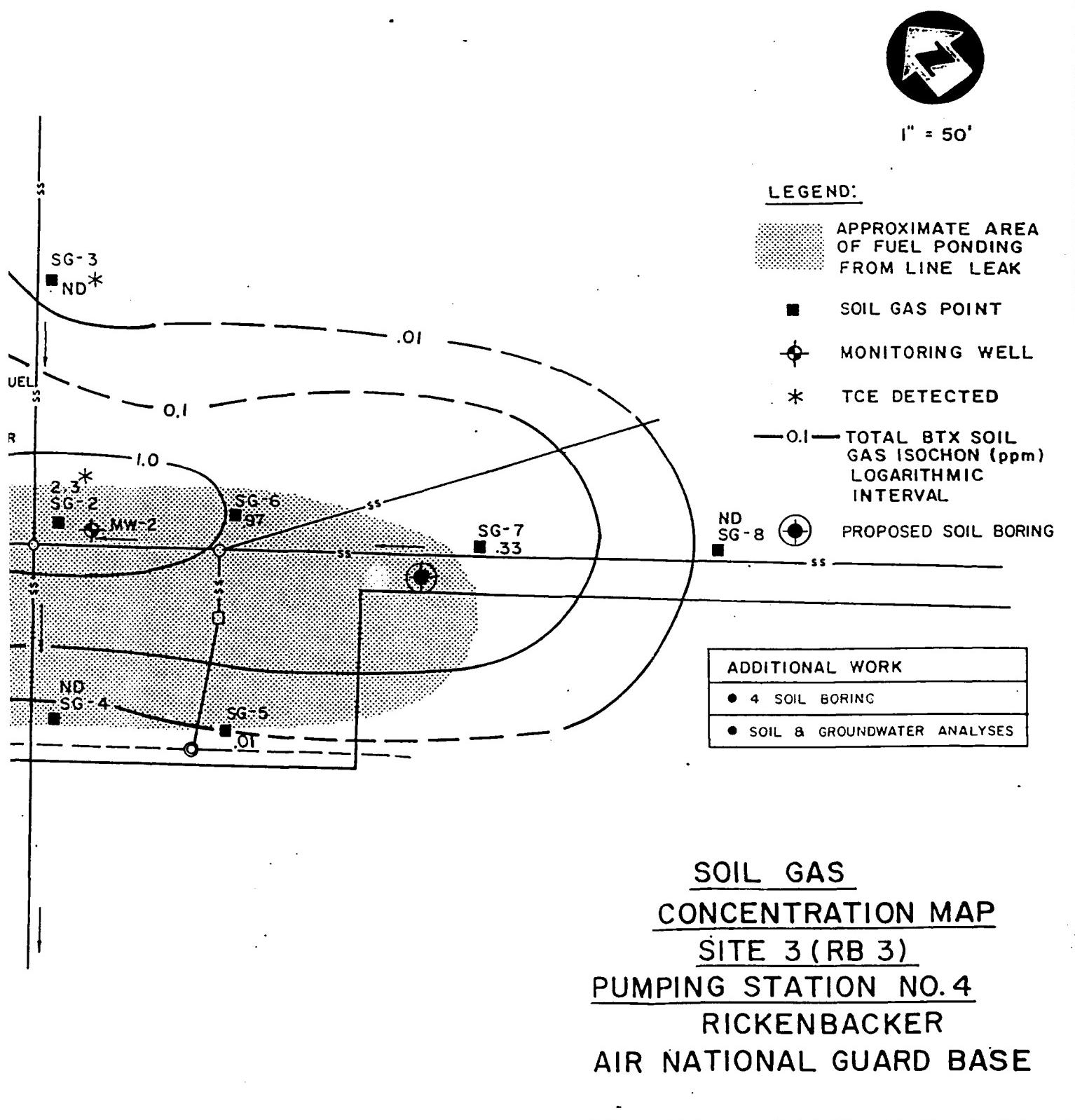


FIGURE 3.2



from each boring. Groundwater samples will be collected from the two existing monitoring wells. Laboratory analysis for volatile organics (CLP), petroleum hydrocarbon (EPA Method 418.1) content and lead (total and dissolved for water samples) will be performed on all environmental samples collected.

Two soil borings will be drilled to a depth of fifteen feet or at initial occurrence of the water table. Location of these borings will be east of the existing MW-1 (Figure 3.3). Soil samples will be collected at five foot intervals. The two samples from each boring with the highest PID value will be sent to the laboratory for analysis.

Groundwater samples will be collected from the two existing monitoring wells on site for laboratory analysis.

3.4 SITE 5: Lateral Safety Zone Spill Area

Previous work on Site 5 included a seventeen-point soil gas survey and the installation of two groundwater monitoring wells. The purpose of the additional sampling at Site 5 is to test whether volatile organic compounds are present in the soil and groundwater beneath the site. During additional SI sampling, one soil boring will be drilled and groundwater samples will be collected from the two existing wells. All environmental samples from Site 5 will be analyzed for aromatic volatile organics (SW-846 Method 8020) and petroleum hydrocarbons (EPA Method 418.1).

One soil boring will be drilled to a depth of fifteen feet or initial encounter of the water table. Figure 3.4 is a map showing the proposed boring location. Soil samples will be collected at five foot intervals. The two samples with the highest PID values will be sent to the laboratory for analysis.

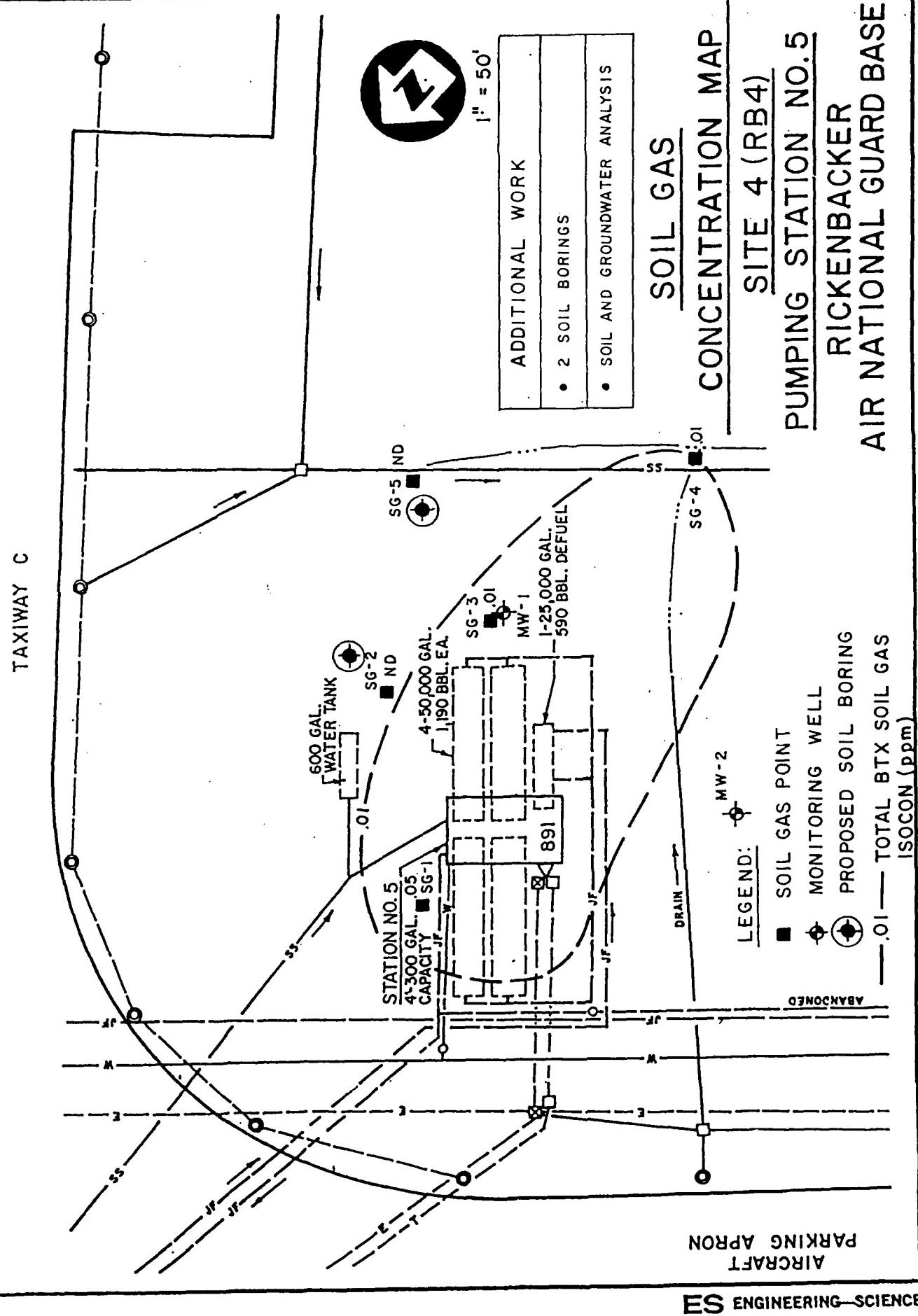
Groundwater samples will be collected for laboratory analysis from the two existing monitoring wells on site.

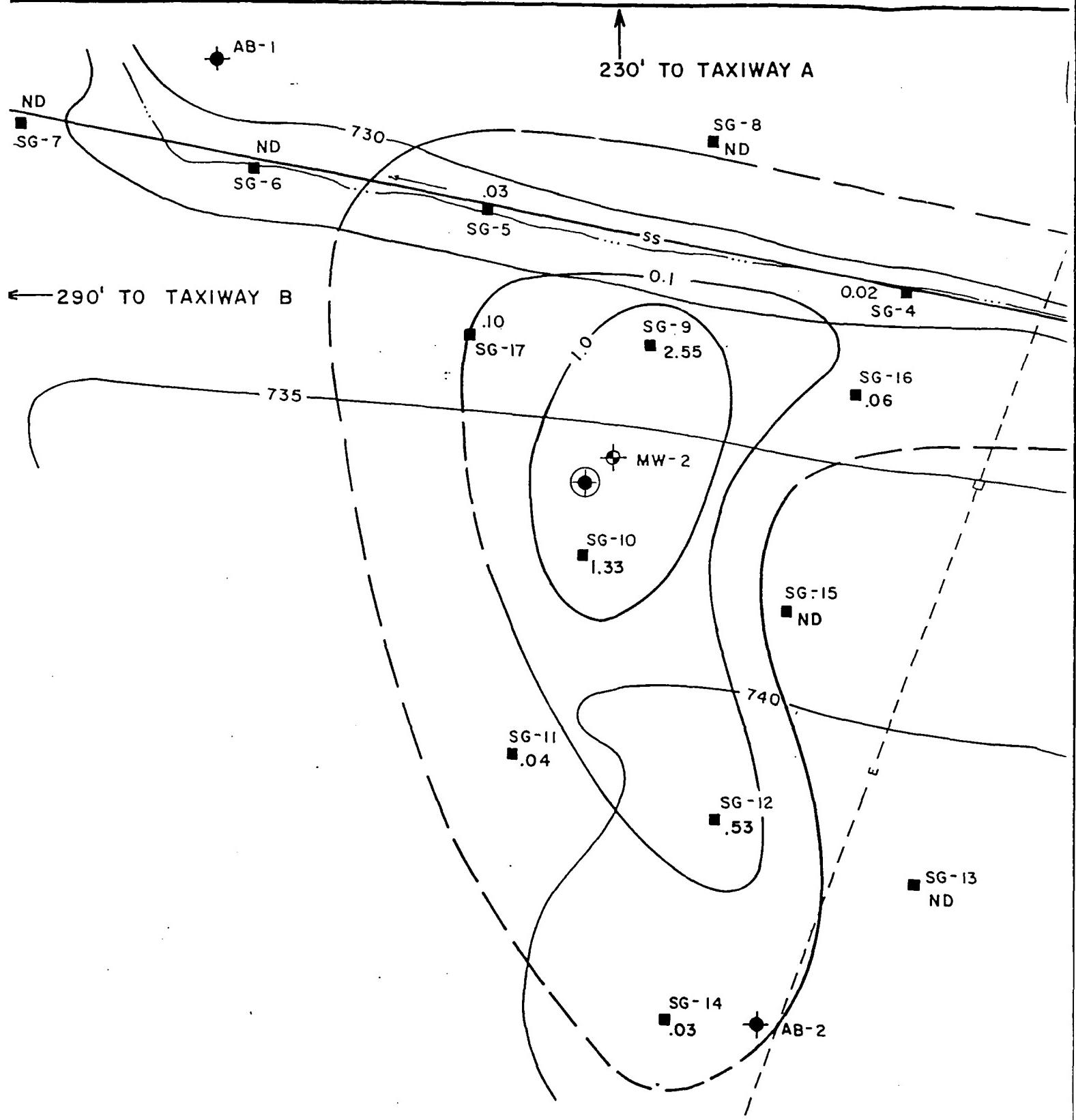
3.5 SITE 6: Base Filling Station

Previous site activities included a eight-point soil gas survey and the installation of one monitoring well. The purpose of the additional sampling at Site 6 is to

FIGURE 3.3

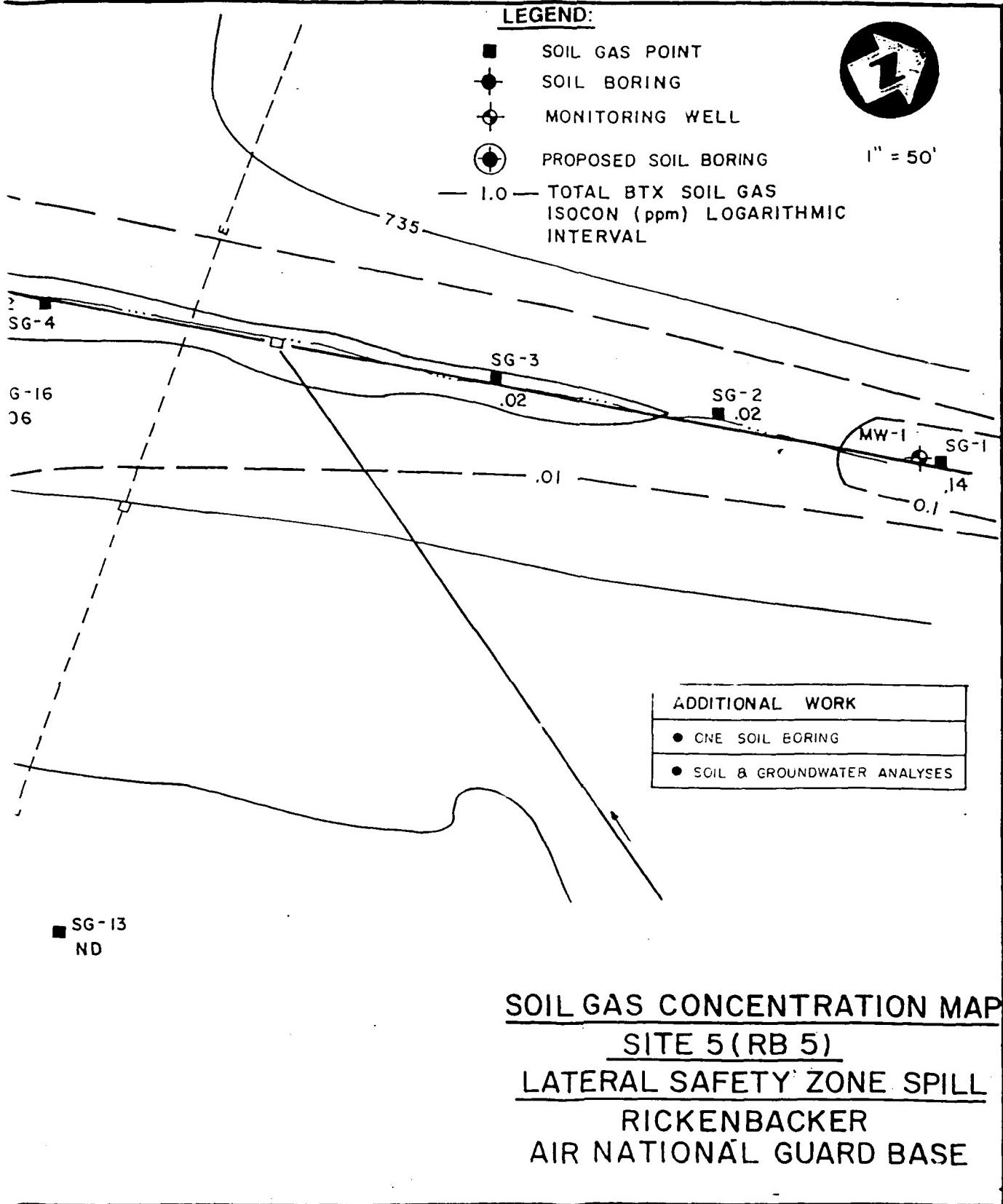
SOURCE: BASE DETAILED SECTIONAL MAP





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FIGURE 3.4



determine whether hydrocarbons are present in the soil and groundwater downgradient from the pump islands. During additional site investigation sampling, one monitoring well will be installed and a slug test performed at the well. Soil and groundwater samples will be collected at the new well, along with water samples from the existing well. Laboratory analysis for all environmental samples collected will include tests for aromatic volatile organics (SW-846, Method 8020), petroleum hydrocarbons (EPA Method 418.1) and lead (total and dissolved for water samples).

The additional monitoring well will be located northeast of the existing well (Figure 3.5). Soil samples will be taken at five foot intervals, each soil sample will be tested for organic headspace content with the PID in the field. The two samples with the highest PID readings will be sent to a laboratory for analysis.

A slug test will then be carried out on the new well to determine hydrogeologic characteristics of the aquifer in the vicinity of the groundwater monitoring well.

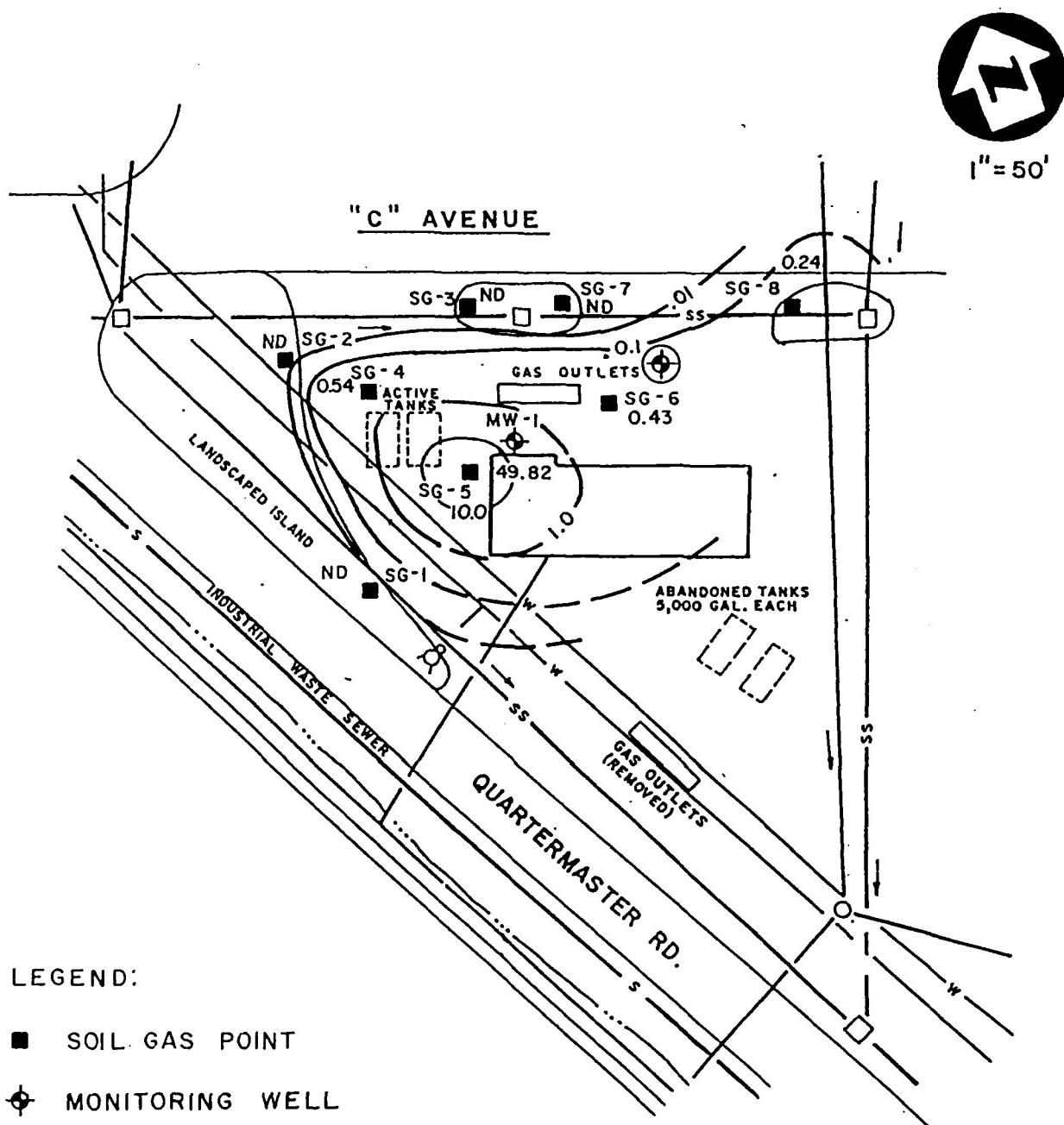
3.6 SITE 9: Salvage Yard

Previous site activities at Site 9 included an eight-point soil gas survey, ten hand borings around the edges of the pavement, and the installation of one groundwater monitoring well. The additional investigation will consist of resampling the groundwater from the existing monitoring well and analyzing for total and dissolved priority pollutant metals. The purpose of the additional work is to conclude whether Site 9 can be exempted from the Remedial Investigation.

3.7 SITE 10: JP-4 Fuel Line Rupture

Previous site activities at Site 10 included a six-point soil-gas survey and the installation of one groundwater monitoring well. In the additional investigation, two soil borings will be drilled, and one of the borings will be completed as a monitoring well. Soil samples will be collected during drilling, along with groundwater samples from the new and existing monitoring wells. Laboratory analysis for all samples collected (both soil and water) will include tests for volatile organics (SW-846 Method 8240) and petroleum hydrocarbons (EPA Method 418.1) and priority pollutant metals (total and dissolved for water samples).

FIGURE 3.5



ADDITIONAL WORK

- ONE TWO-INCH MONITORING WELL
- SOIL AND GROUNDWATER ANALYSIS
- SLUG TEST

SOURCE:
BASE DETAILED SECTIONAL MAPS.

**SOIL GAS CONCENTRATION MAP
SITE 6 (RB6)
BASE FILLING STATION
RICKENBACKER
AIR NATIONAL GUARD BASE**

The purpose of the additional sampling is to determine whether volatile organic compounds are present in the soil and groundwater beneath the site. The soil boring and monitoring well will be located north and west respectively, of the existing well at Site 10 (Figure 3.6). The boring will be drilled to fifteen feet or to the top of the water table. The monitoring well will be completed five to ten feet into the top of the shallow aquifer. Soil samples will be collected at five foot intervals. The two soil samples from each boring having the highest headspace PID value will be sent to the laboratory for analysis.

Groundwater samples will be collected for laboratory analysis from the new monitoring well, and from the existing well on site. A slug test will be performed on the new well.

3.8 SITE 12: Old Drum Storage Area

The previous investigation included a seven-point soil gas survey, ten hand borings and the installation of one groundwater monitoring well. During the additional SI work, one monitoring well will be installed. Soil and water samples will be taken from the new monitoring well. These samples will be analyzed for volatile organic compounds (CLP) and petroleum hydrocarbons (EPA Method 418.1).

The purpose of the additional sampling at Site 12 is to test the soil and groundwater for volatile organics (VOCs) in the vicinity of several hand borings (HB-7, HB-8, HB-10) where these compounds were detected. One groundwater monitoring well will be installed in the upper portion of the shallow aquifer. The well will be located west and hydraulically upgradient from the existing monitoring well (Figure 3.7). Soil samples will be collected at five foot intervals during drilling operations. The two samples with the highest PID values will be sent to the laboratory for analysis. Groundwater samples will be taken for laboratory analysis from the existing monitoring well and the new well on site.

A slug test will be performed on the new groundwater monitoring well, to determine hydrogeologic characteristics of the aquifer in the vicinity of the well.

FIGURE 3.6

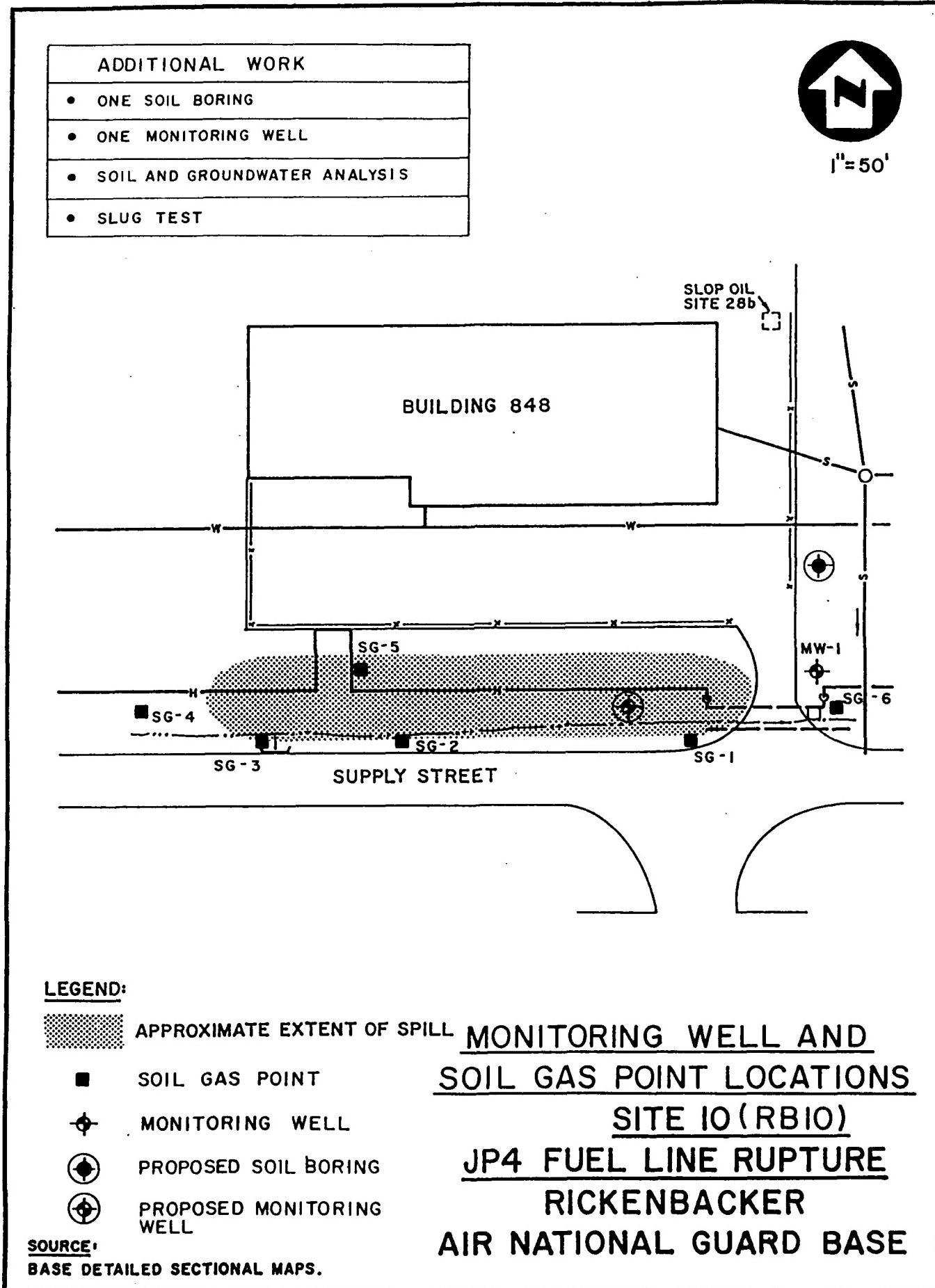
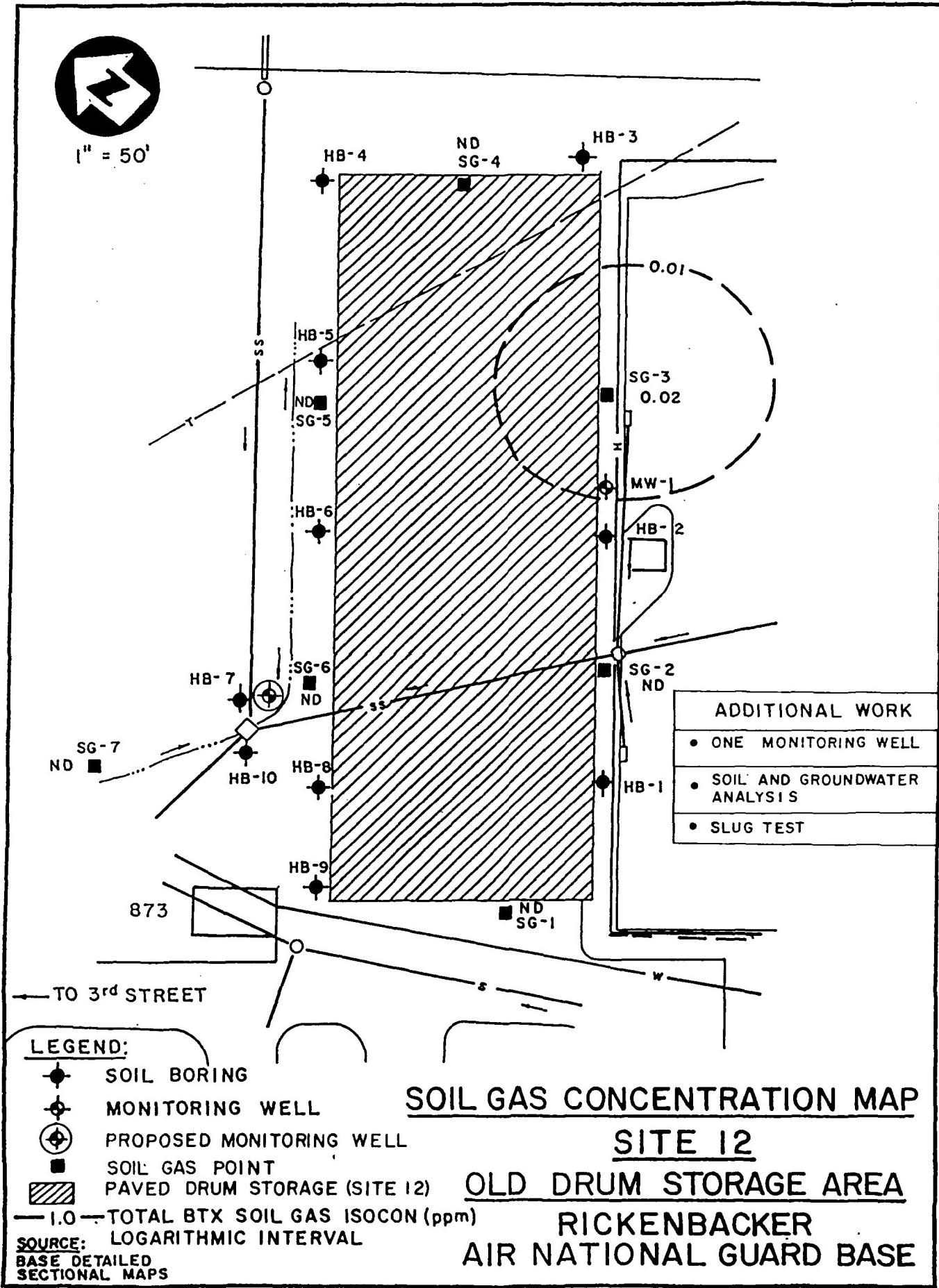


FIGURE 3.7



3.9 SITE 14: KC 135 Crash Site

During the previous investigation, site activities included a ten-point soil-gas survey and the installation of two groundwater monitoring wells. The purpose of the additional sampling at Site 14 is to determine whether volatile organic compounds are present in the groundwater from the two existing wells. Laboratory analysis for aromatic volatile organics (SW-846 Method 8020) and petroleum hydrocarbons (EPA Method 418.1) will be performed on these water samples.

3.10 SITE 15: Southwest Fuel Dump Pit

Previous site activity included a twenty-three point soil-gas survey and the installation of two monitoring wells. Soil samples were collected from two soil borings. During the additional SI sampling, two soil borings will be drilled. Soil samples from each boring and groundwater samples from all monitoring wells will be collected. Laboratory analysis for aromatic volatile organics (SW-846 Method 8020), petroleum hydrocarbons (EPA Method 418.1) and lead (dissolved and total for water samples) will be performed on all samples.

The purpose of the additional sampling is to test whether volatile organics and lead are present in the soil and groundwater beneath the site.

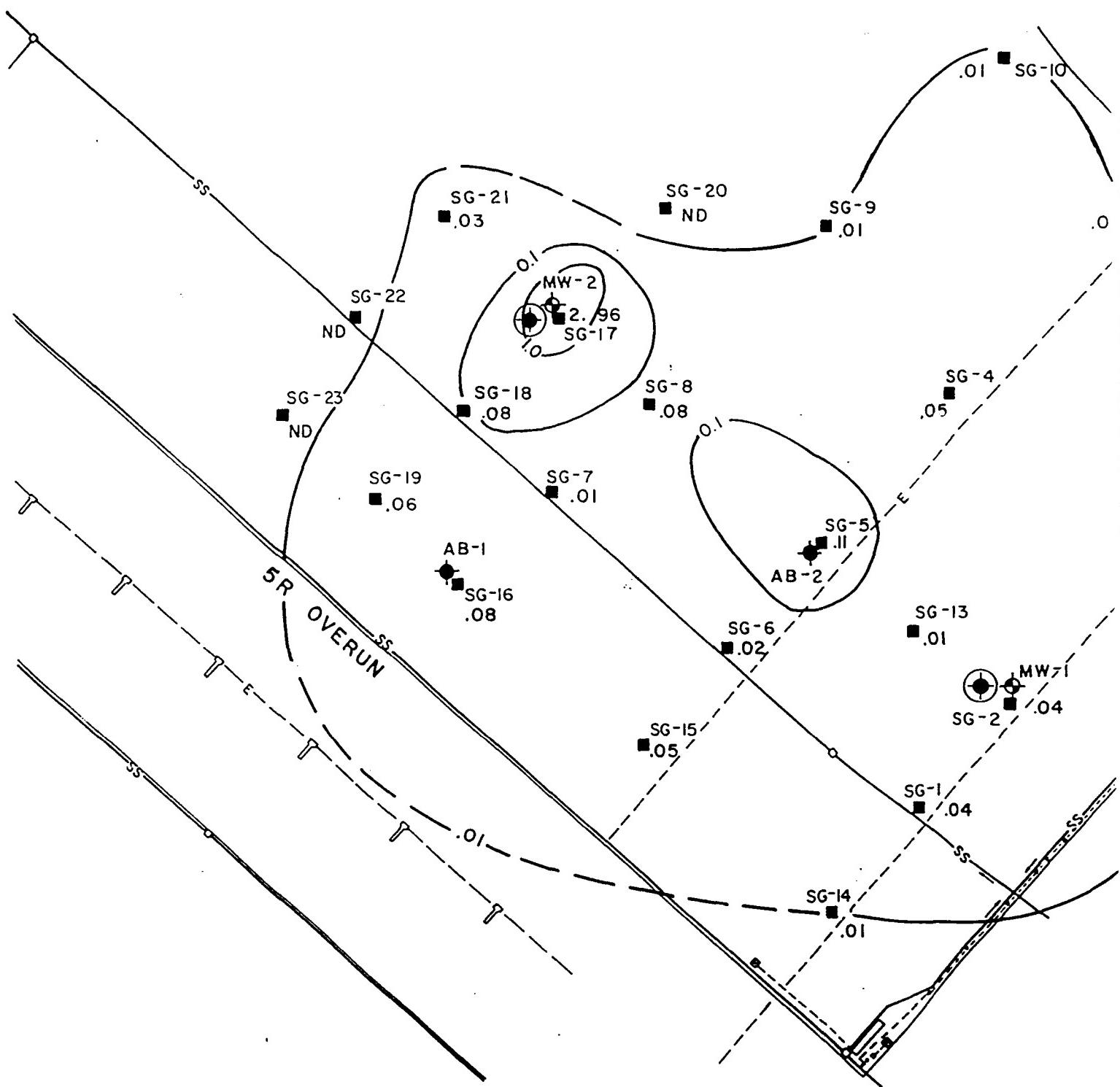
The two soil borings will be drilled to a depth of fifteen feet or initial depth of the water table, whichever occurs first. These borings will be located adjacent to the existing monitoring wells (Figure 3.8). Soil samples will be collected at five foot intervals during drilling operations. The two soil samples from each boring having the highest PID headspace VOC value will be sent to the laboratory for analysis.

3.11 SITE 16: Northeast Fuel Dump Pit

Previous site activity included a sixteen-point soil-gas survey and the installation of two monitoring wells. Soil samples were collected from two soil borings. During the additional SI sampling, two soil borings will be drilled. Soil samples from each boring and groundwater samples from all monitoring wells will be collected. Laboratory analyses for aromatic volatile organics (SW-846 Method 8020), petroleum hydrocarbons (EPA Method 418.1) and lead (dissolved and total for water samples) will be performed on all samples.

The purpose of the additional sampling is to test whether volatile organics and lead are present in the soil and groundwater beneath the sites.

The two soil borings will be drilled to a depth of fifteen feet or initial depth of the water table, whichever occurs first. These borings will be located adjacent to the existing monitoring wells (Figure 3.9). Soil samples will be collected at five foot intervals during drilling operations. The two soil samples from each boring having the highest PID headspace VOC value will be sent to the laboratory for analysis.



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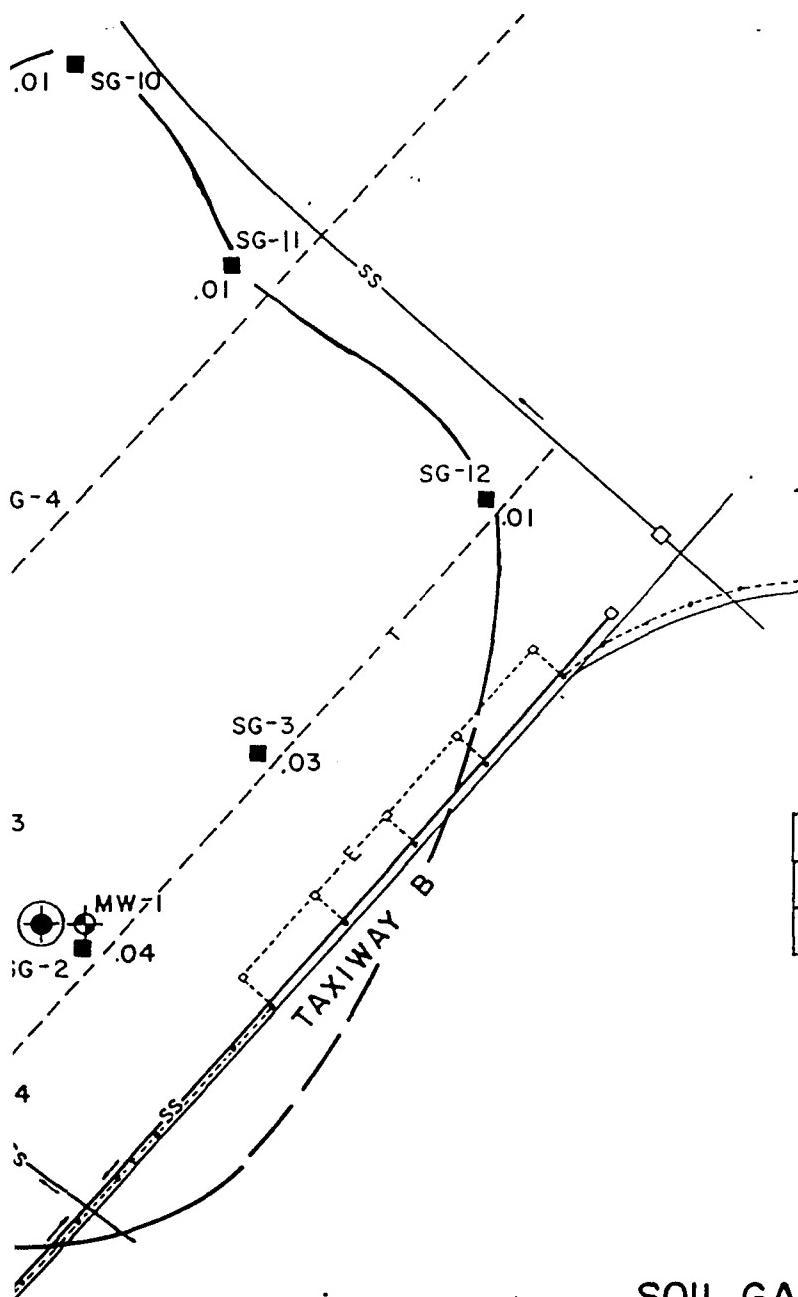
FIGURE 3.8



1" = 100'

LEGEND:

- SOIL BORING
- MONITORING WELL
- SOIL GAS POINT
- 1.0 — TOTAL BTX SOIL GAS ISOCON (ppm) LOGARITHMIC INTERVAL
- (○) PROPOSED SOIL BORING



ADDITIONAL WORK	
●	TWO SOIL BORINGS
●	SOIL & GROUNDWATER ANALYSES

SOIL GAS CONCENTRATION MAP
SITE 15 (RB15)
SOUTHWEST FUEL DUMP PIT
RICKENBACKER
AIR NATIONAL GUARD BASE

ES ENGINEERING SCIENCE

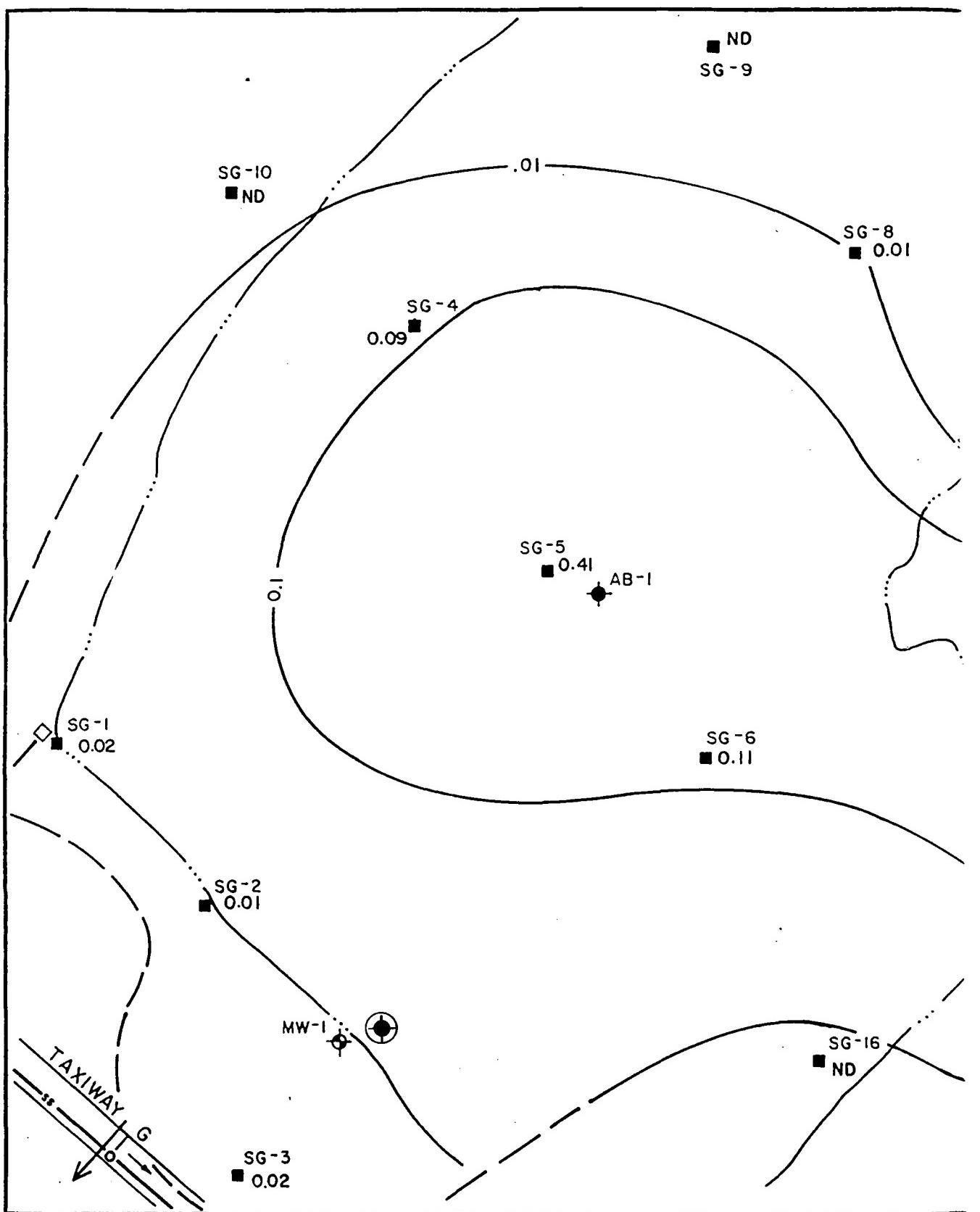
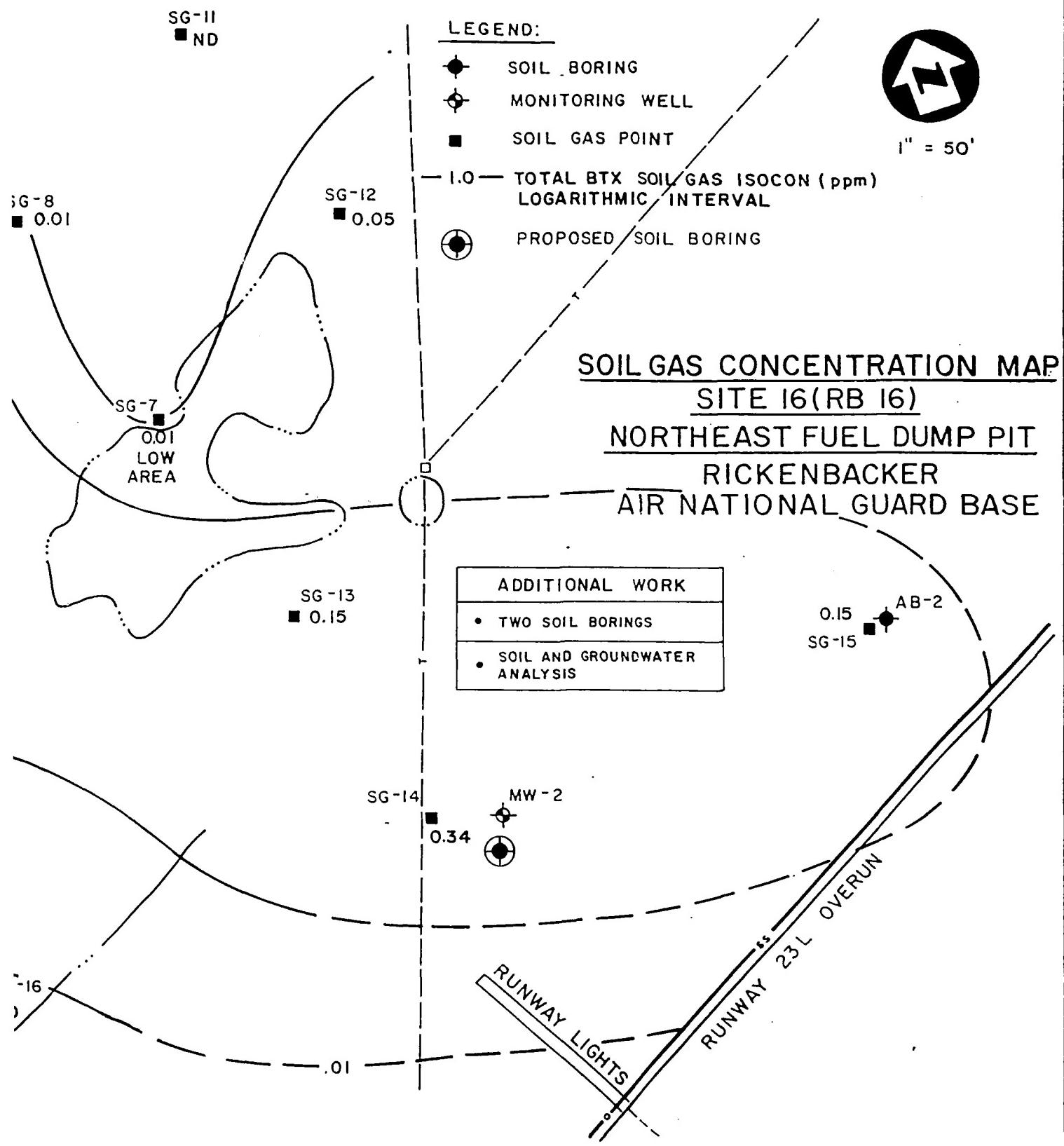


FIGURE 3.9



3.12 SITE 17: Old Entomology Lab

During the initial investigation, site activities included hand borings and the installation of one monitoring well. During the additional SI sampling, the existing groundwater monitoring well will be sampled. Laboratory analysis for pesticides and herbicides (SW-846 Methods 8080 and 8150) will be performed on the water sample. The purpose of the additional sampling is to conclude whether Site 17 can be removed from the Remedial Investigation.

3.13 SITE 19: North Coal Pile

Previous activities for Site 19 included a nineteen-point soil-gas survey, installation of two groundwater monitoring wells, drilling of four soil borings, and collection of ditch water and sediment samples.. The purpose of the additional sampling is to substantiate the presence of hydrocarbons in the groundwater beneath Site 19. During the additional SI sampling, water samples from the existing monitoring wells will be collected. Laboratory analysis will include tests for volatile organics (CLP), petroleum hydrocarbons (EPA Method 418.1), priority pollutants metals (total and dissolved), sulfates (EPA Method 9038), alkalinity (EPA 310.1), acidity (EPA 305.1) and base/neutral semi-volatile organics (CLP).

3.14 SITE 20: South Coal Pile

Previous site activities included a twelve-point soil-gas survey, the installation of two groundwater monitoring wells, drilling of four soil borings, and collection of two ditch water and two sediment samples. The purpose of the additional sampling at Site 20 is to install a downgradient monitoring well in order to test the soil and groundwater for hydrocarbons near a high BTX soil-gas concentration (SG-7). During the additional SI sampling, one monitoring well will be installed, water samples from the new and existing wells will be collected, and a slug test of the new monitoring well will be performed. The new monitoring well will be installed south of the existing MW2, at the location shown on Figure 3.10. Laboratory analysis will include tests for volatile organics (CLP), petroleum hydrocarbons (EPA Method 418.1), priority pollutants metals (total and dissolved for water) sulfates (EPA Method 9038), alkalinity (EPA 310.1), acidity (EPA 305.1), and base/neutral semi-volatile organics (CLP).

3.15 SITE 21: Leaking Drum and Oil Change Area at Water Plant

Previous site activities included six hand borings and soil analysis. During this investigation one soil boring and one groundwater monitoring well will be placed on site.

Soil and water samples will be collected and a slug test of the new monitoring well will be performed. Laboratory analysis of all environmental samples. Analysis will include tests for aromatic volatile organics (SW-846 Method 8020), petroleum hydrocarbons (EPA Method 418.1) and priority pollutants metals (total and dissolved on all water samples). The soil boring will be drilled southeast of the water treatment plant (Figure 3.11), to determine vertical hydrocarbon content of the soil. This boring will be drilled to a depth of fifteen feet or to the water table. Soil samples will be collected at five foot intervals, and the two samples having the highest headspace PID values will be sent to the laboratory for analysis.

One groundwater monitoring well will be placed at a depth of thirty feet or occurrence of upper aquifer. This well will determine the relative amount of hydrocarbons in the water and will be located hydraulically downgradient from the leaking drum area. Two soil samples will be collected during drilling based on the criteria discussed in the previous paragraph. The soil samples, along with groundwater samples taken from the monitoring well, will be sent to the laboratory for analysis.

The groundwater monitoring well will have a slug test performed on it to determine hydrogeologic characteristics of the aquifer in the vicinity of the well.

3.16 SITE 22: Heat Plant Lube Oil Drum Storage Area

During previous investigations, soil samples were collected from two hand borings. Additional SI sampling will include: the installation of one soil boring and one monitoring well, the collection and chemical analysis of soil and water samples and a slug test on the new monitoring well. Laboratory analysis will be conducted on all environmental samples collected and will include tests for volatile organics (CLP) and petroleum hydrocarbons (EPA Method 418.1).

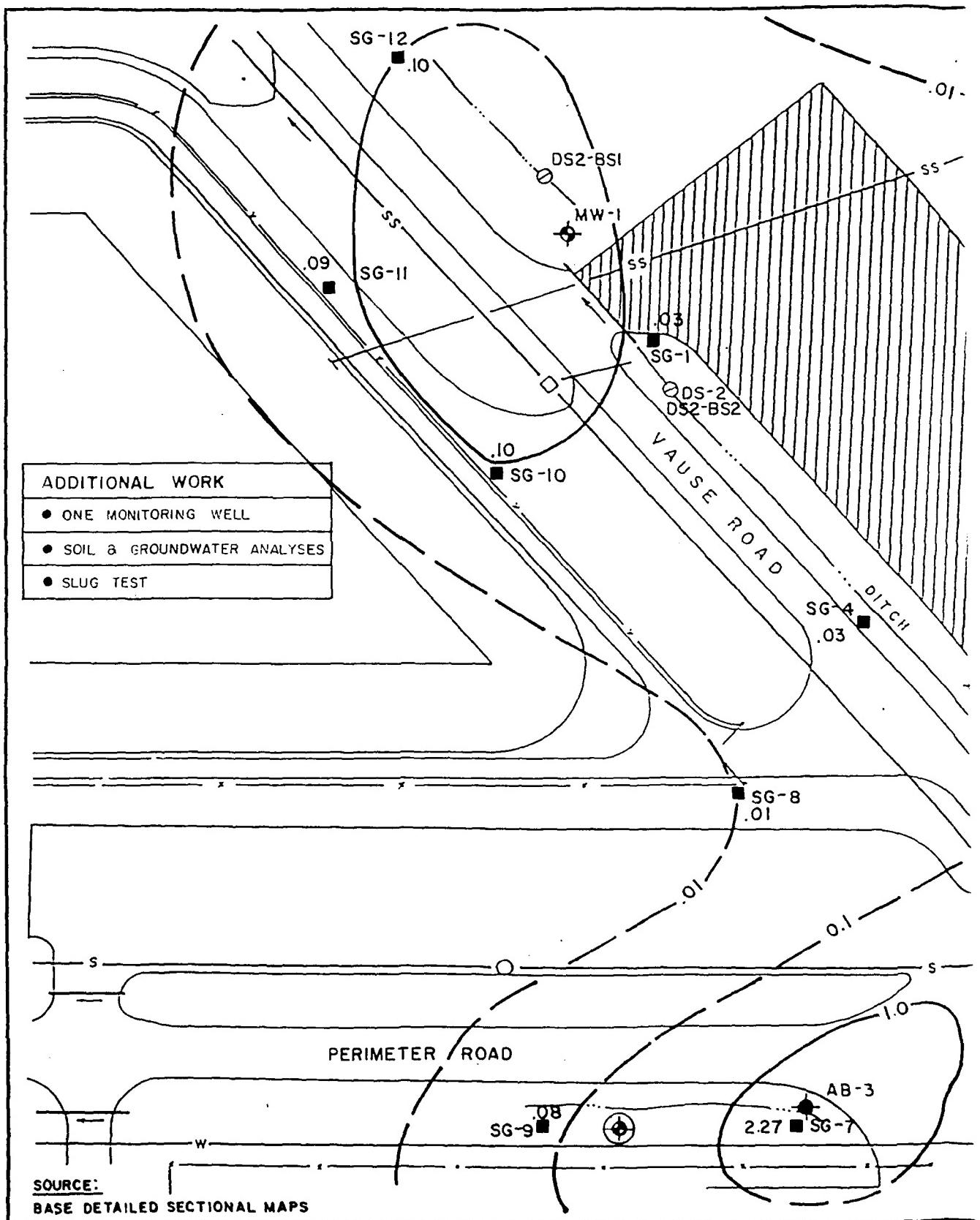
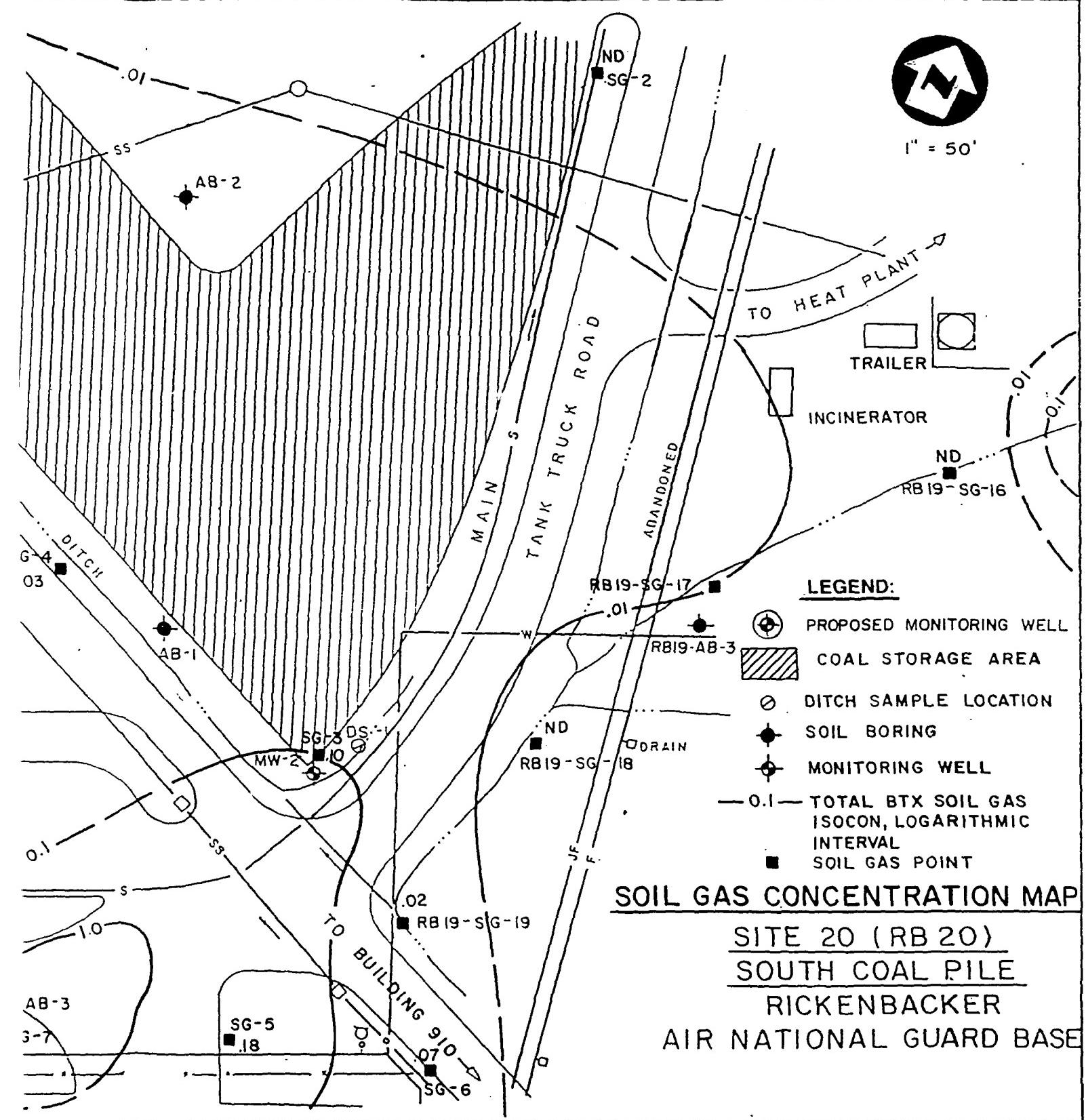


FIGURE 3.10



One soil boring will be drilled southeast of the heating plant (Figure 3.12) to a depth of fifteen feet or initial occurrence of the water table. The purpose of the boring is to determine the vertical extent of the hydrocarbons. Soil samples will be taken at five foot intervals. The two samples with the highest headspace PID values will be sent to a laboratory for analysis.

FIGURE 3.11

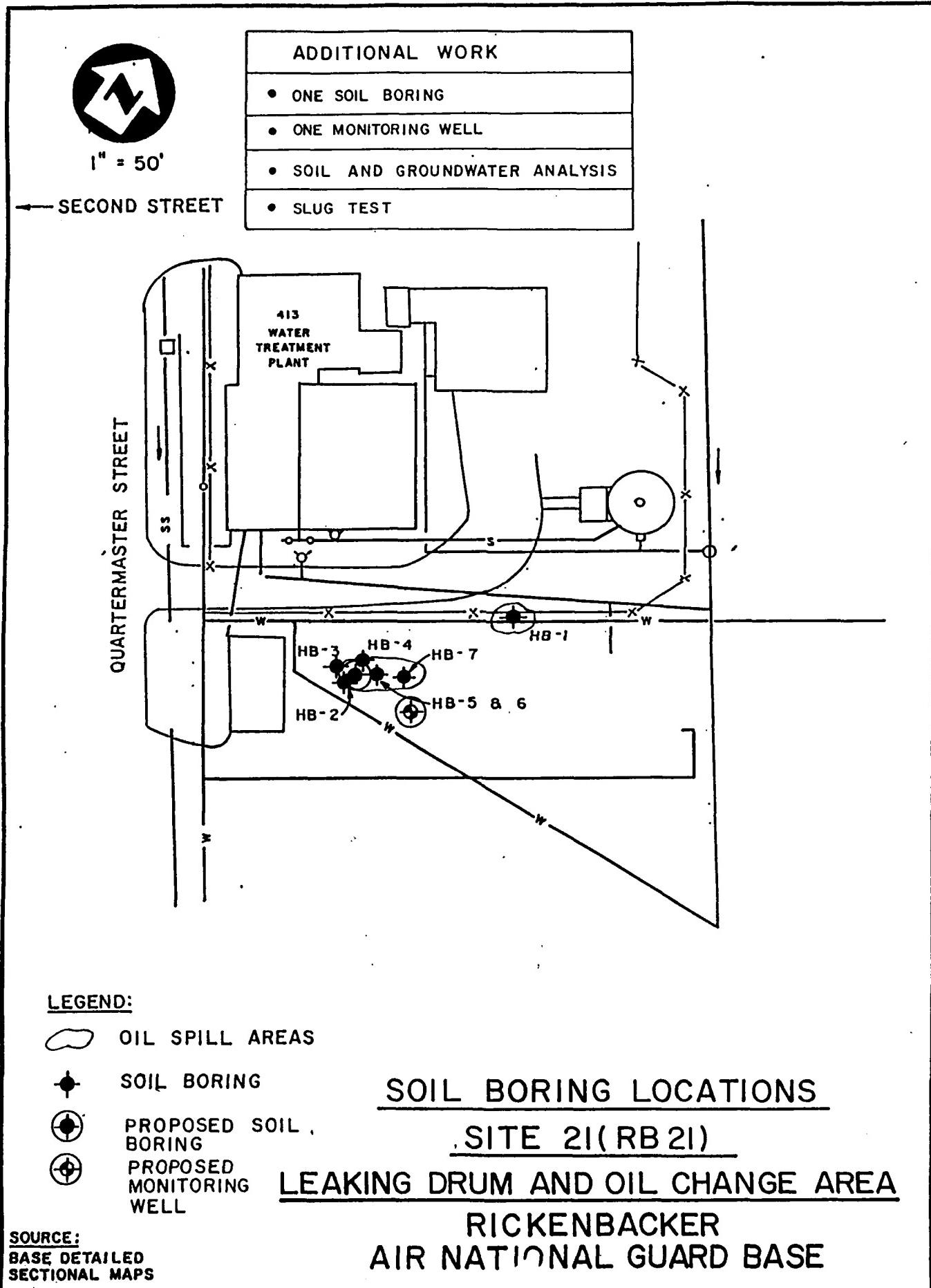
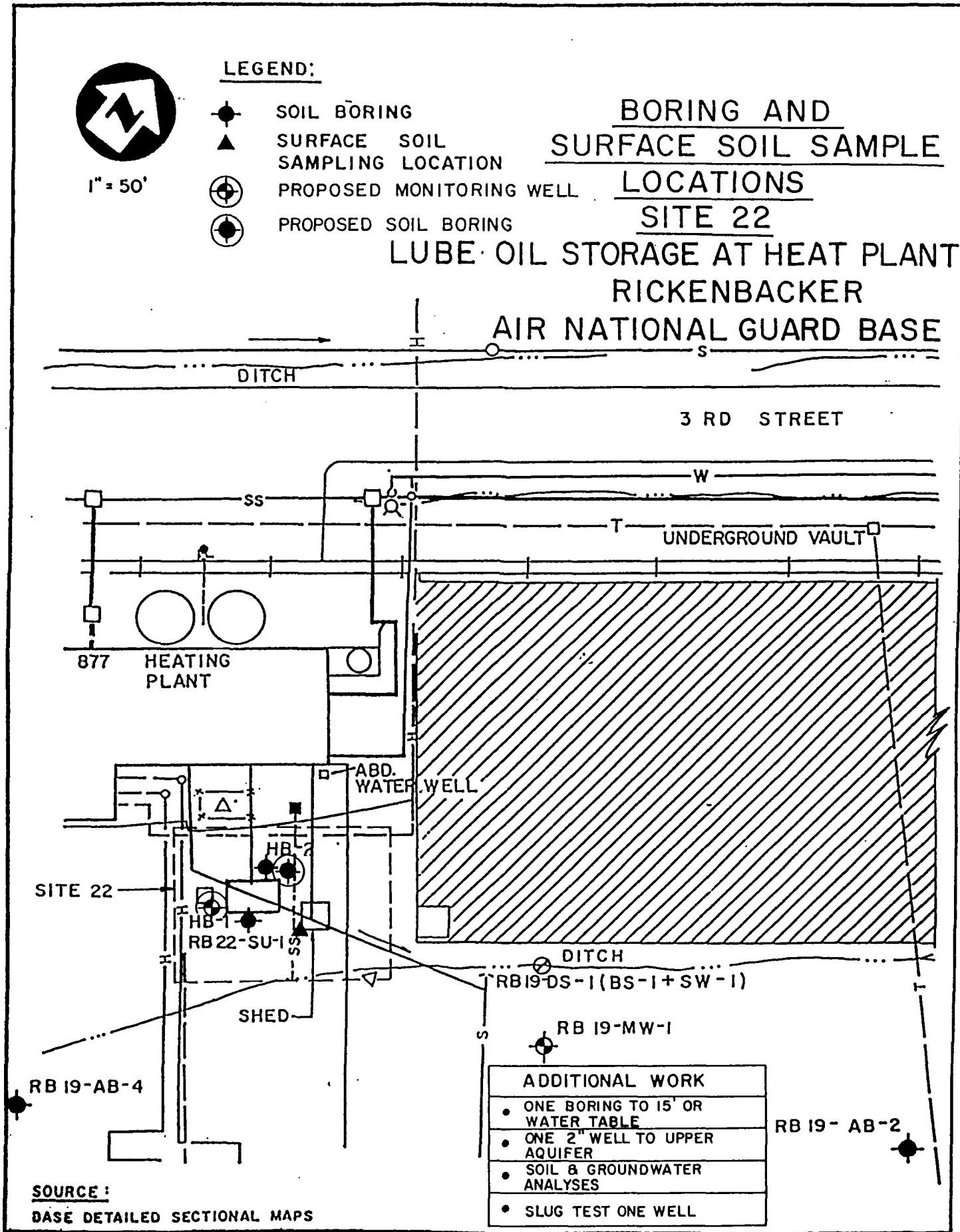


FIGURE 3.12



One groundwater monitoring well will be installed southeast and hydraulically downgradient of the heating plant. Soil samples will be collected during drilling in accordance with the sampling procedure described in the preceding paragraph. Groundwater samples will be collected and analyzed to test for the presence or absence of dissolved hydrocarbons.

A slug test will be performed on the new groundwater monitoring well to determine hydrogeologic characteristics of the aquifer in the vicinity of the well.

3.17 SITE 23: Fire Training Area

Previous site activities included a twenty-five point soil-gas survey, drilling of eight soil borings, and the installation of four groundwater monitoring wells. Site activities for this investigation includes: installation of one groundwater monitoring well, the collection and analysis of soil and groundwater samples, and a slug test on the new monitoring well. All environmental samples collected will be analyzed for volatile organics (CLP), base/neutral semi-volatile organics (CLP) and priority pollutant metals (total and dissolved for water samples).

The purpose of the additional sampling at Site 23 is to install a downgradient monitoring well, and to substantiate whether contaminants are present in the groundwater. One groundwater monitoring well will be installed on site to a depth of 30 feet or occurrence of the upper aquifer. It will be located west and hydraulically downgradient of the existing monitoring wells (Figure 3.13). Soil samples will be taken at five foot intervals, and the two samples with the highest headspace PID values will be submitted for analysis. These soil samples along with water samples from the new and existing monitoring wells will be collected for further laboratory analysis. A slug test will be performed on the new groundwater monitoring well to determine hydrogeologic characteristics of the aquifer in the vicinity of the well.

3.18 SITE 24: Sewage Treatment Plant Sludge Beds

During the previous investigation, twenty soil samples were collected from the surface of the sludge beds, four from hand borings in the sludge spreading area, and three groundwater monitoring wells were installed.

During the additional SI sampling, one groundwater monitoring well will be installed, soil and groundwater samples will be collected, and a slug test conducted on the new monitoring well. Laboratory analysis on the environmental samples collected will include tests for priority pollutant metals (total and dissolved for water samples).

The purpose of the additional sampling at Site 24 is to install a downgradient monitoring well, and confirm whether dissolved metals are present in the groundwater beneath the site. The new monitoring well will be located hydraulically downgradient of hand borings 1 through 4 (see Figure 3.14). The well will be completed at the top of the shallow aquifer. Soil samples will be collected at five foot intervals during drilling, and the two most visibly contaminated samples will be sent to the lab for analysis. Groundwater samples will be collected from all wells for analysis.

A slug test will be performed on the new monitoring well to determine hydrogeologic characteristics of the aquifer in vicinity of the well.

3.19 SITE 25: Storm Drainage Ditch System

Previous site activities included bottom sediment and surface water sampling at thirty locations at ditch intersections, and the installation of four groundwater monitoring wells at drainage basin oil/water separators. Site activities during the additional SI sampling will include groundwater sampling of each of the existing wells. Laboratory analysis for these samples will include a test for priority pollutant metals (total and dissolved). The purpose of the additional sampling is to test whether dissolved metals are present in the groundwater beneath the site.

3.20 SITE 27: Drainage Ditch Near Landfill

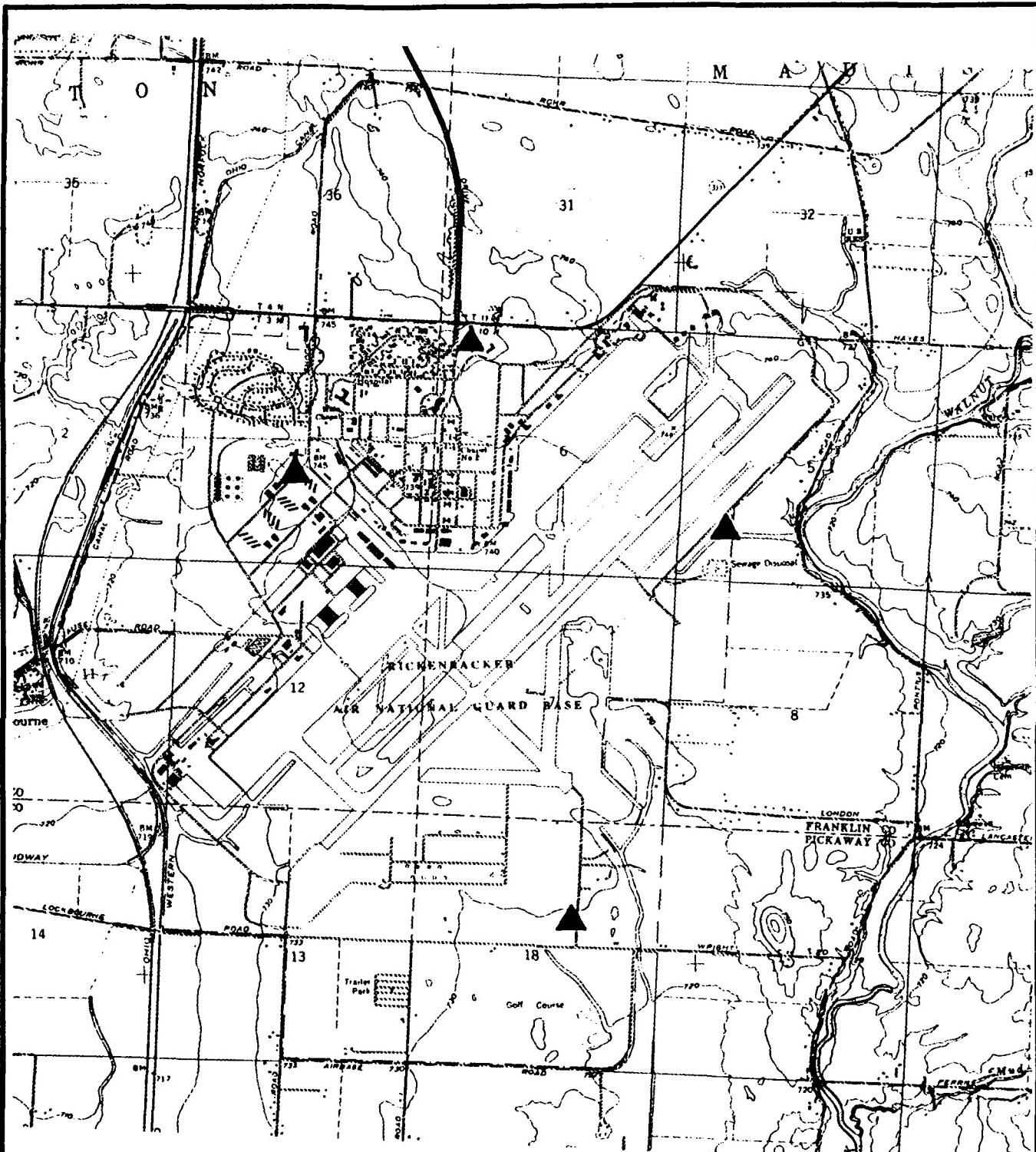
During Phase 1 of the site investigation site activities included bottom sediment and surface water sampling and the installation of one groundwater monitoring well. The purpose of the additional sampling is to test whether dissolved metals are present in the groundwater beneath the site. Site activities for the additional SI sampling will include water sampling of the existing well. Laboratory analysis of the water samples collected will be for priority pollutant metals (total and dissolved).

3.21 Background Soil Samples

Four locations at the RANGB have been chosen to determine a background metal content for the soils. At each location the soil boring will be drilled to a depth of fifteen feet or initial occurrence of the water table. Two soil samples will be collected from each boring at the ground surface (upper 6 inches) and at the water table. The soil samples will be analyzed for priority pollutant metals.

As shown in Figure 3.15, the four locations are spread out across the base. One boring is located west of the Airbase Road and Wright Road intersection, a second boring located north of the sewage disposal area (Site 24), a third boring located near the visiting officers quarters and the fourth boring north of the railroad tracks by the housing area.

FIGURE 3.15



BACKGROUND
SOIL SAMPLING LOCATIONS
RICKENBACKER
AIR NATIONAL GUARD BASE

LEGEND:

- ▲ BACKGROUND SOIL
SAMPLE COLLECTION
LOCATION**

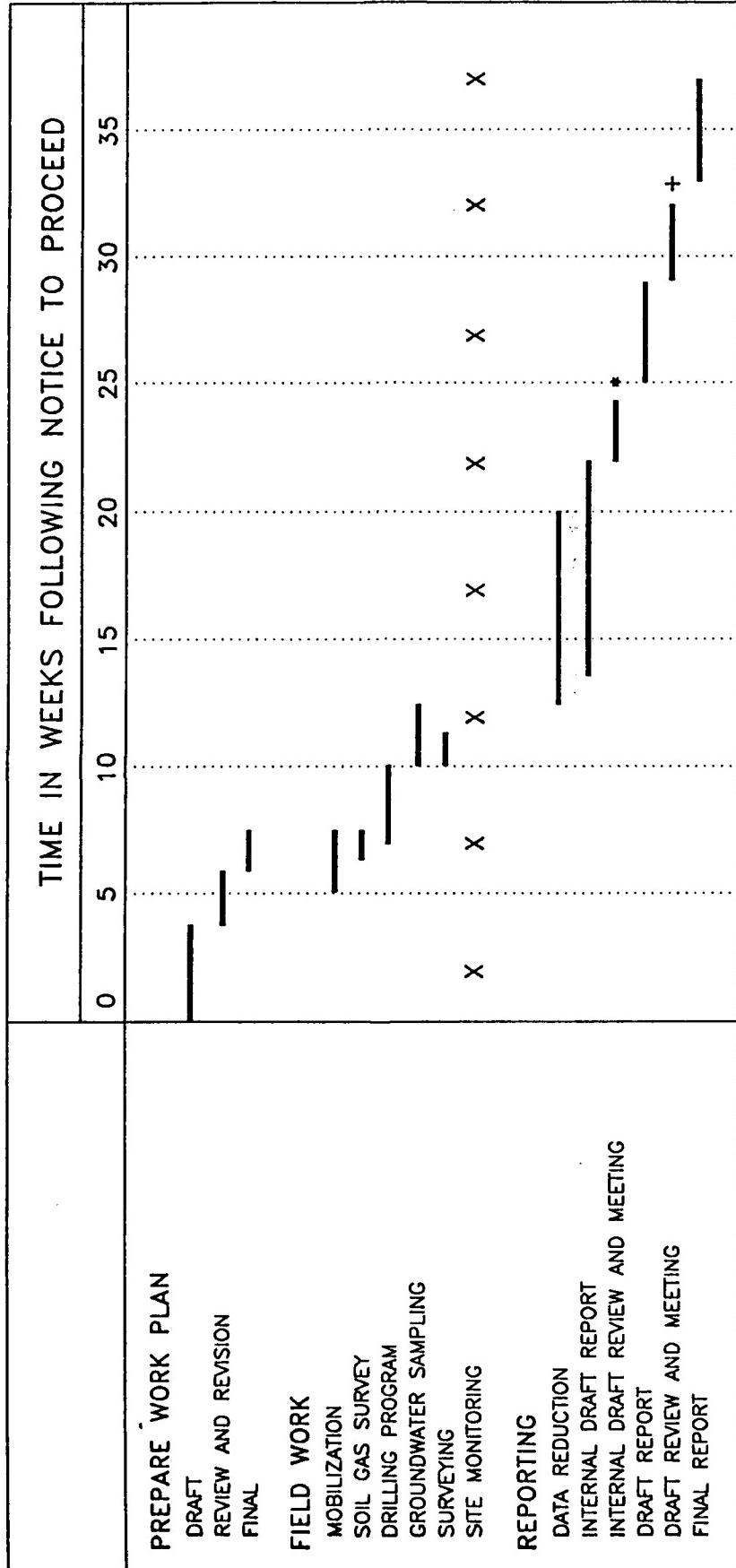
SECTION 4.0

WORK SCHEDULE

Table 4.1 is a projected work schedule for the additional Site Inspection activities that will be conducted at the Rickenbacker ANGB sites. The schedule assumes a two week NGB/HAZWRAP review and revision period between submittal of the Draft and Final Addendum Work Plan. It is assumed that a third draft of this Work Plan will not be required.

FIGURE 4.1

**PROJECTED WORK SCHEDULE
ADDITIONAL SITE INSPECTION
RICKENBACKER ANGB, OHIO**



SYMBOLS: X SITE VISIT
 * MEETING AT ANGSC, ANDREWS AFB
 + REGULATORY REVIEW, RICKENBACKER ANGB